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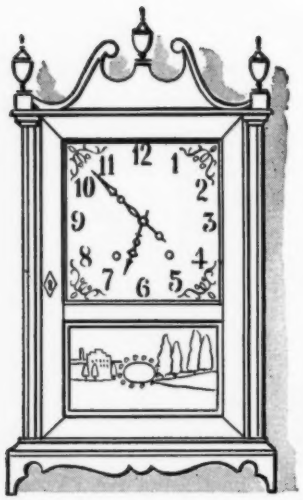

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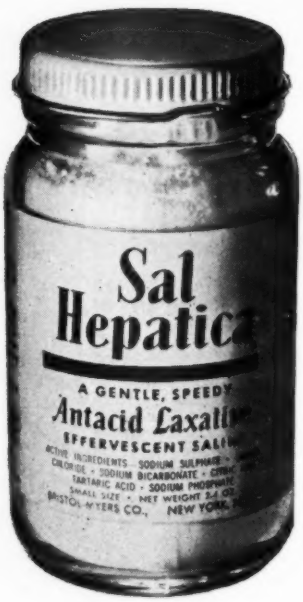

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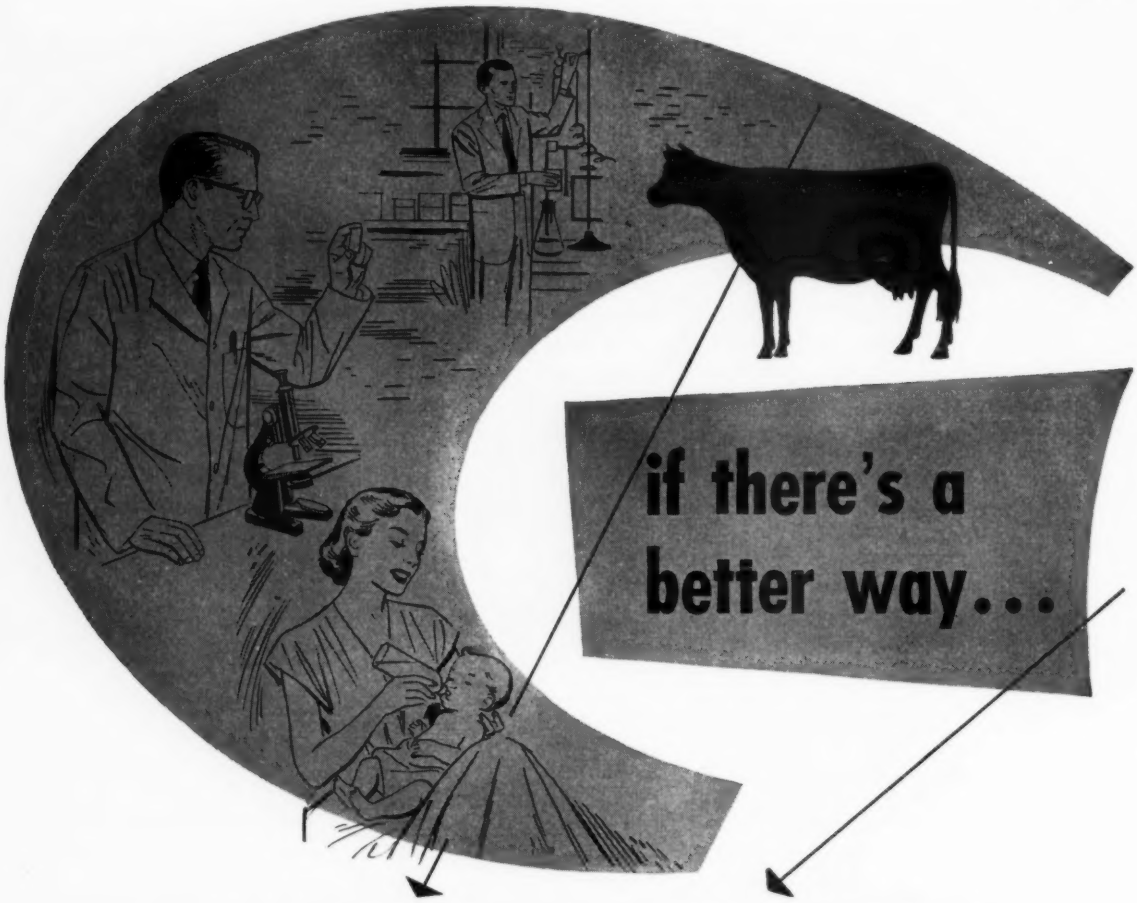

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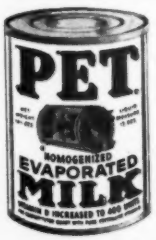

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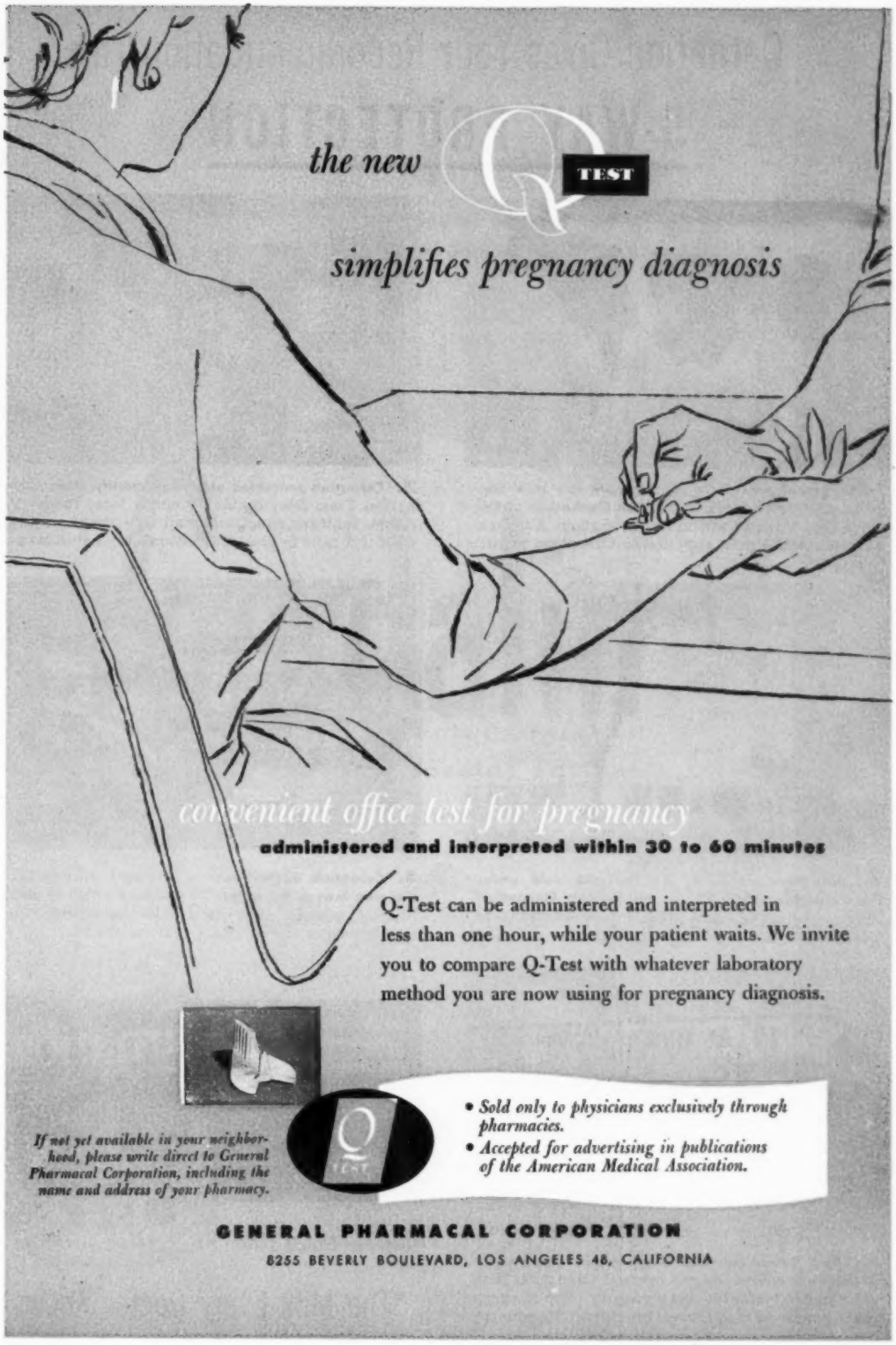
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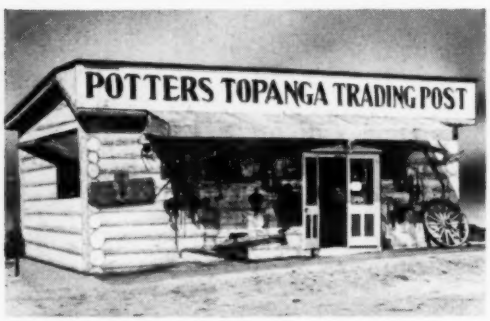

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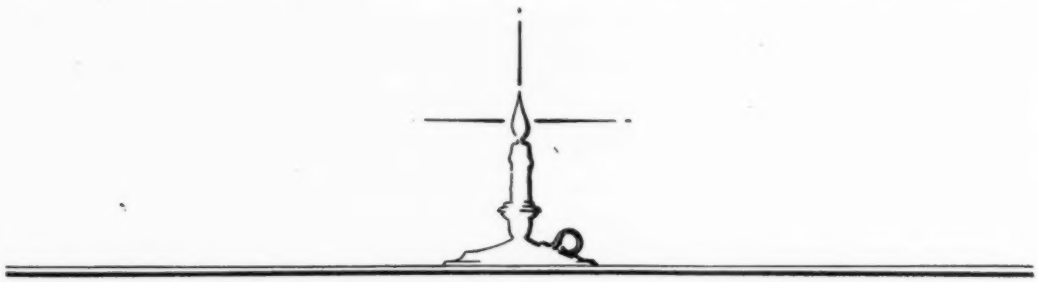

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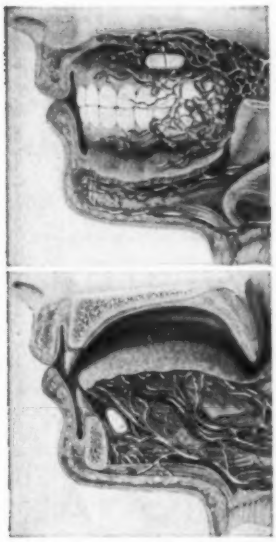

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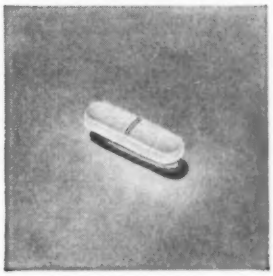

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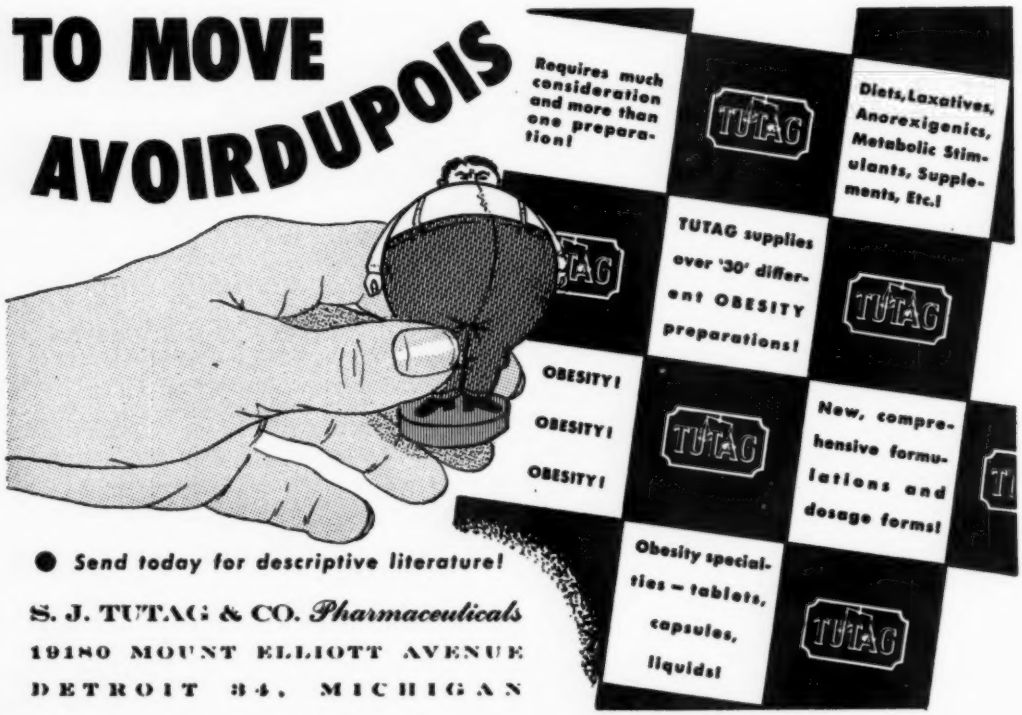

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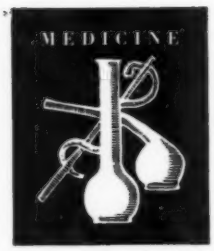

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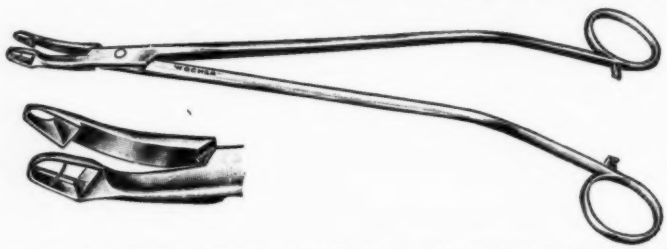

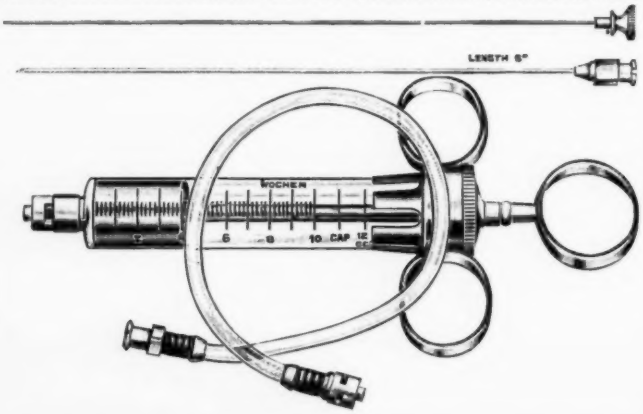

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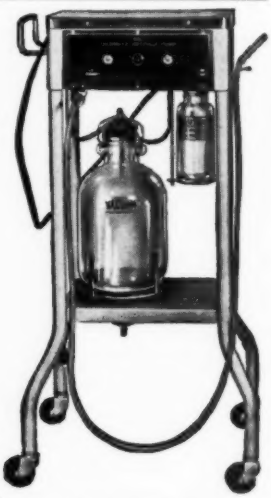

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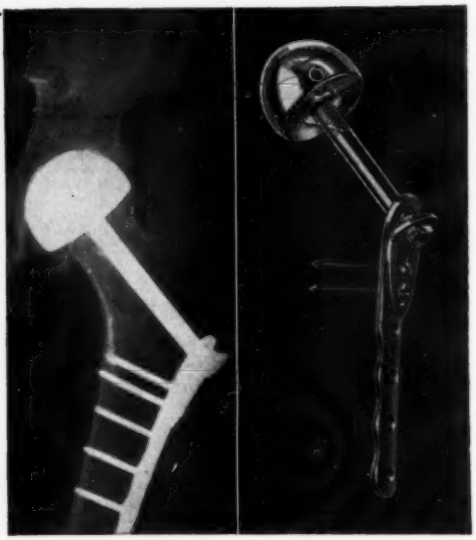

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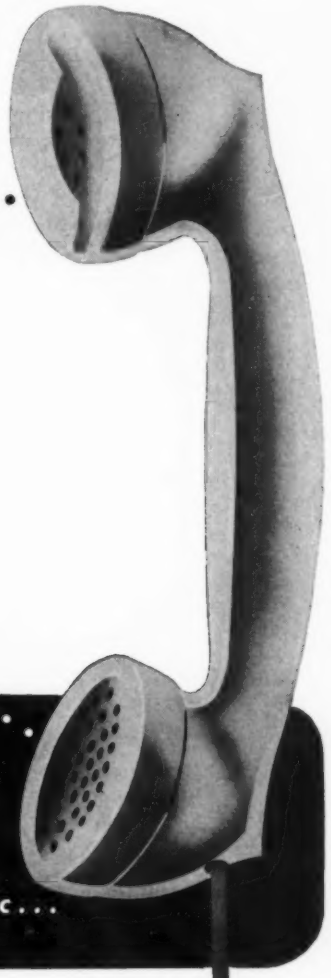

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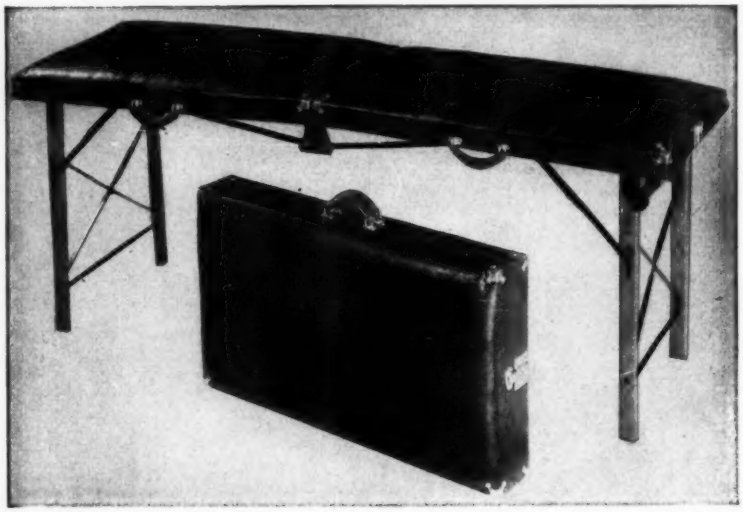

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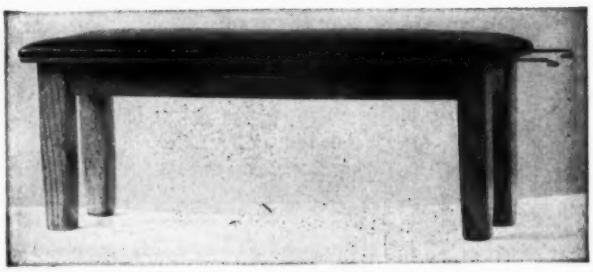

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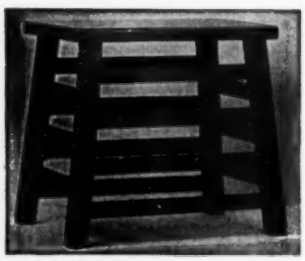

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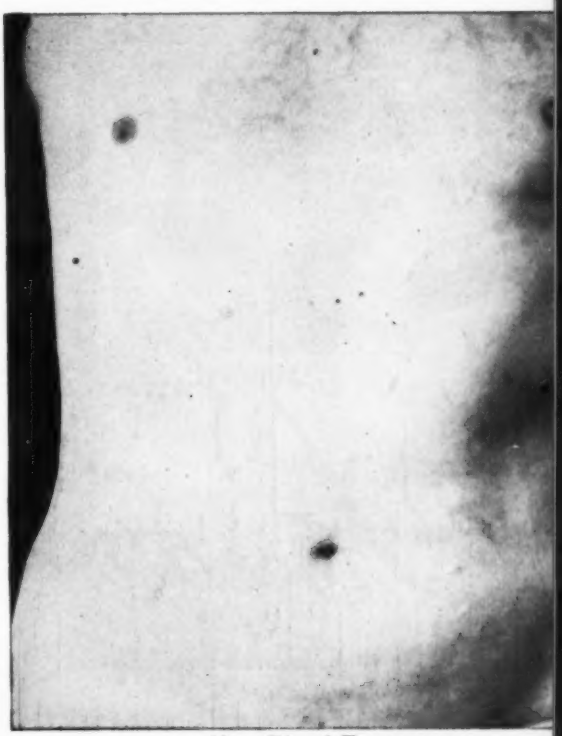

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ROLE OF SWINE DISEASES IN DISEASES OF MAN*

Richard E. Shope, M.D.

Swine diseases play a minor role in unfavorably influencing human health, and the only human pathogen which seems to have a deleterious effect on swine is the influenza virus.

The relationship between diseases in swine and disease in man is usually considered a rather direct one, having to do with the spread of disease from swine to man by direct contact, by intermediate vectors, or by the ingestion of meat. However, a serious uncontrolled epizootic of a disease such as hog cholera in the swine population would have considerable effect on the food supply of the entire Nation.

SWINE DISEASES

The diseases of swine which have a direct relationship to disease in man are: trichinosis, taeniasis, balantidiosis, brucellosis, salmonellosis, anthrax, and erysipeloid.

Trichinosis is a preventable disease, usually acquired by eating uncooked or unfrozen trichinous pork, and is one of the major hazards to human health presented by swine.

Man is actually the definitive host of *Taenia solium*, although the cycle involves both pig and man and can be broken in either the intermediate or definitive host. Man acquires his tapeworm by ingesting inadequately cooked pork containing *Cysticercus cellulosae*, and in turn serves as the source from which swine acquire their infection.

Balantidium coli, the one swine protozoa of importance to man, is a normal inhabitant of the swine gastrointestinal tract and is apparently completely innocuous to the pig, but, transferred to the human gastrointestinal tract, it causes clinical illness and sometimes a moderate secondary anemia. However, the infection rarely fulminates and causes death.

Probably the most serious of the four bacterial infections of swine that are medically important to human beings is that caused by *Brucella suis*. This infection may produce a debilitating febrile illness in man that may permanently incapacitate or even kill him. The swine *Brucella* can and does infect cattle and may thus infect man through contaminated milk. *Br. suis* infection in human beings is primarily an occupational disease which will not be eliminated until the reservoir of infection in swine is eradicated.

All species of *Salmonella* found in swine are potential human pathogens. *Salmonella choleraesius* causes a septicemic type of infection, similar to typhoid fever, with leukopenia and fever, and with complications such as purulent meningitis, bacterial endocarditis, pyelonephritis, empyema, and abscesses in various parts of the body. Any poorly cooked pork that has been improperly handled during slaughter or processing is a possible source of danger.

Swine anthrax is dangerous to the farmer or veterinarian handling or autopsying the infected animal. The anthrax bacillus has also caused fatal infections in man when ingested in inadequately cooked pork. However, by ordinary care, it should be possible to keep human exposure to infection to a minimum.

Infections caused by the swine erysipelas organism, *Erysipelothrix rhusiopathiae*, result in acute dermatitis with marked erythema on the hands and wrists. The condition is not common even in butchers, meat handlers, and veterinarians, the occupational groups most frequently exposed to infection.

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*Brief of paper presented at annual meeting of the American Veterinary Medical Association, June 23-26, 1952, reprinted from *Public Health Reports*, October, 1952.

EPIDEMIOLOGY OF RABIES*

Raymond Fagan, D.V.M., M.P.H.

A disease of animals and man that resembled rabies was described in 3000 B.C., and about 500 B.C., the first adequate description of the disease was recorded. Pasteur's studies in the nineteenth century influenced the thinking of the world on rabies, but diagnosis was not established on a sound basis until 1903, when Negri discovered in the motor cells of the central nervous system the intracytoplasmic inclusion body which bears his name and which is considered as pathognomonic of the disease.

The etiological agent of rabies is a filterable, submicroscopic virus which varies in virulence and in immunogenic capacity. Rabies is usually transmitted through the bite of a rabid animal, and pathogenesis is believed to be neurogenic. The incubation period may vary from a few days to 6 to 9 months.

The vampire bat is the only known carrier of rabies. All attempts to demonstrate the carrier state or to create a carrier state experimentally in other animals have failed thus far.

With the exception of Australia, New Zealand, and Hawaii, which have never had rabies and where strict quarantine regulations are enforced, rabies is found in all climates and in all types of ecologic communities of warm-blooded animals. In the United States, rabies may occur at any time of year.

Immunization undertaken approximately 30 days prior to exposures will usually induce resistance lasting one year, and perhaps as long as two or more years, but there is no reliable evidence that vaccine given after exposure to virulent rabies can protect against a clinical attack of the disease. However, evidence is accumulating that hyperimmune antirabies serum given after an exposure will so alter circumstances that vaccine can be used with efficacy.

Within specific areas rabies incidence shows definite peaks and valleys, but as yet no analysis has been made of the factors which contribute to the dynamics of these epidemic curves.

RABIES CONTROL

Two procedures are available to control rabies: prevention of contact between infected animals and susceptible animals, and reduction of the number of susceptible animals within an area. Leash laws, which, if enforced, prevent contact between infected animals and susceptible animals and man, have been virtually abandoned in the United States, leaving only the second method of control—reducing the density of susceptible individuals.

With some species of wildlife, attempts at control of numbers have succeeded in stabilizing the population. However, mere increase in numbers of animals, even when the rabies virus is present, does not mean an epizootic of rabies. Although epizootics and large wild animal populations seem to be associated, sporadic outbreaks do not justify extensive control operations.

In cities, control measures consist of enforcing leash laws and picking up stray dogs and/or vaccinating pet animals on either a voluntary or compulsory basis.

In controlling rabies in both wildlife and domestic animals, one type of program may be successful in one area and not in another.

Some veterinary administrators advocate that all clinical cases of rabies seen by veterinary practitioners be reported to a collecting agency. However, the present practice of having the diagnostic laboratory work on individual cases and report positive findings seems to be completely adequate.

*Brief of paper presented at annual meeting of the American Veterinary Medical Association, June 23-26, 1952, reprinted from *Public Health Reports*, October, 1952.

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*Lowry, K. F.: Management of Resistant, Non-healing Skin Lesions, Postgrad. Med. *11*:523, 1952.

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STUART F. HARKNESS, D.O.

Coordinator of the Cancer Teaching Program†
Des Moines Still College of Osteopathy and Surgery
Des Moines, Iowa

Cancer ranks second as a cause of death in this country today. In 1944 a subcommittee of the National Advisory Cancer Council, recognizing that practicing physicians generally were not aware of the methods by which this disease might be controlled, made a study of cancer teaching in medical schools.[1] The report of this committee indicated a need for improvement in cancer teaching. In 1946, a conference of representatives responsible for the planning of instruction in schools of medicine was held at the National Cancer Institute.[2] As a result of this conference, funds were made available to medical schools by the United States Public Health Service, to coordinate and improve the undergraduate teaching of cancer. In 1950 similar grants became available to the recognized osteopathic colleges.

Cancer is curable. Experimental research, utilizing the knowledge of the various natural sciences, is making slow but definite progress in determining the nature of the cancer cell. When this mystery is solved, we may then search for and find the substance or substances which will prevent cancer. At present, however, our hope of controlling this disease rests in the ability of the physician to recognize it in a stage where surgery and x-ray may stop its reproduction. Our ability to diagnose cancer at a curable stage has not kept pace with therapeutic advances. This deficiency forms the basis for the present philosophy of the undergraduate teaching of cancer in osteopathic and medical schools.

Studies to determine the various reasons for delay in diagnosis or institution of treatment indicate that both physician and patient are equally at fault. With educational programs aimed at the public, patients are presenting themselves earlier for examination and are becoming increasingly conscious of the value of the routine periodic examination while still asymptomatic. The general practitioner, usually the family physician, most frequently sees the patient in the curable stage but fails to recognize the disease. This indicates the necessity for educational programs designed to improve physicians' knowledge of cancer—its nature, diagnosis, and treatment. The average general practitioner will make the diagnosis of cancer only several times each year, even if he is very alert. This affords him no opportunity to see a diversity of cases. From these facts, it appears that the most logical time to train the physician in *all* aspects of cancer is in his undergraduate years.

There is no single approach to the modern teaching of cancer which is applicable to all medical schools. There are, however, certain basic principles and technics which, when applied to any curriculum, will be successful in increasing the student's knowledge of cancer. In planning the program for undergraduate teaching of cancer, certain fundamental aims or objectives are important:

1. To increase the student's understanding of the biology of normal growth and development and of genetic influences.

2. To bring to the student's attention current opinions concerning the nature of neoplasia. Knowledge of the interplay of constitutional factors, genetically controlled, carcinogens and carcinogenesis gives him a broad perspective of the cancer control problem. As he progresses into the clinical years this knowledge will provide a background for better understanding of diagnostic and therapeutic problems.

3. To teach him to appreciate what is wrong with the cancer patient. This will enable him to more fully understand the principles, complexities, and shortcomings of cancer detection tests. This knowledge forms a basis for rational therapy of the cancer patient as a whole. In this disease, as in all others, it is necessary to inculcate into the student the concept of treating the individual and not his disease.

4. To make the student aware that the only hope of cure for the cancer patient, at present, is the early diagnosis of the disease. The methods of early cancer diagnosis must be stressed.

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5. To inform the student of the availability, principles, and end results of definitive methods of treatment.

6. To teach the principles of palliative treatment.

7. To instill in the student the philosophy of "going the last mile" with the incurable patient, the methods for relief of pain, and a more acute appreciation of the psychiatric, economic, and social aspects of the disease.

The principles and methods utilized to achieve these objectives are variable. Nevertheless, of fundamental importance is the correlation of the basic sciences with clinical experience. Student participation, whenever possible, will greatly enhance the effectiveness of the cancer teaching program. Correlation is best achieved through a qualified, cooperative, interdepartmental team of individuals who are especially interested in the cancer problem. This group is known in most institutions as the Tumor Committee. Through their assistance and advice certain aspects of the problem may be stressed in the various basic sciences. Added emphasis may be placed upon it during the clinic years. This is referred to as the horizontal approach.

The crowded medical school curriculum, unfortunately, does not permit addition of clock hours to individual courses, and the horizontal method still leaves many gaps in the student's knowledge of cancer. For this reason, to meet the needs of some schools, it is advisable to create a course in oncology—"the sum of knowledge concerning tumors." If instructors, particularly those in the basic sciences, do not have to take hours from their planned courses of instruction to stress cancer, their cooperation in presenting to the students the relation of their particular field to cancer, may be greatly enhanced. Such a course is called the vertical approach. It is usually not feasible to transfer *all* cancer teaching within the schedule of the existing departments to a vertical course. A carefully planned course, dealing with cancer as a systemic disease, serves as a means of integrating all the known facts concerning cancer prevention, and diagnostic and therapeutic principles. Members of the basic science and clinical staff cooperate in offering a course such as is outlined:

1. Genetic aspects
2. Biology
3. Biochemistry
4. Carcinogens and carcinogenesis
5. Pathologic physiology, including methods and routes of spread
6. Diagnosis
   a. Clinical aspects
   b. Laboratory aspects
7. Therapy
   a. Surgical aspects
   b. Radiologic aspects
   c. Chemotherapeutic aspects
   d. Psychiatric aspects
   e. Inoperable cancer
8. Social and economic aspects.

There is a distinct need for both the horizontal and vertical approach, the result being what some institutions have termed an oblique program. Correlation and integration are the keynotes in this plan of instruction. Precautions must be taken that the material is not repetitious or else the entire program becomes uninteresting and less valuable. It is believed that this course is best presented in the junior or senior year.

Additional emphasis may be placed on cancer during the clinic years by means of symposia, seminars, and guest lecturers outstanding in the field. Symposia on pertinent topics are usually presented at regular intervals, bringing together the pathologist, radiologist, surgeon, and internist, and instructors in the basic sciences. These symposia should supplement and not supplant the teaching of cancer by systems, and should stress the practical aspects of cancer problems. The seminar plan of instruction promotes participation by the student and gives him an opportunity to gain experience in self-expression. Students are usually permitted to choose their own topics and their presentation is followed by an open discussion.

Tumor clinic conferences are the most valuable implement for undergraduate teaching of cancer. The Tumor Committee should meet regularly, to examine known or suspected cases of cancer, particularly those which present diagnostic and therapeutic problems. These cases may come from within the institution or are referred from practicing physicians. Conferences actually consist of free group consultations in cooperation with the pathologist, surgeon, radiologist, and internist. In large institutions, the major services may conduct their own conferences, while in smaller institutions, men in the specialty fields are consulted as needed in particular cases. Undergraduate students, usually seniors, are in attendance at all conferences. Here they see the clinical approach to the cancer patient, actually feel tumors, and hear all aspects of the cases discussed in regard to necessary additional diagnostic measures and therapeutic approach, whether it be definitive or palliative. This provides an excellent medium to integrate the basic sciences with clinical experience and to provide student participation.

Student participation in research, whether experimental or clinical, gives much impetus to cancer teaching and is necessary to a successful program. It is not only a stimulus to those participating but creates interest and enthusiasm throughout the entire student body.

Two valuable adjuncts in the cancer teaching program are the use of visual aids and the tumor registry. There is no doubt concerning the vital role which visual aids play in all branches of medical education and particularly those areas pertaining to cancer. Their use necessitates the establishment of a department of medical photography to which the entire faculty has access. Students may also use the facilities of this department for preparation of slides used in their seminars. Excellent films on various fields of cancer also are available through the American Cancer Society.

The tumor registry with an adequate followup system is of inestimable value to the faculty and student body alike. It provides an excellent means of demonstrating the history as well as the natural course of cancer, and it enables the student to follow cases which he has seen in the wards and in the outpatient department. Further a registry provides both faculty and students with material for study and research.

SUMMARY

There is a desperate need for improving and correlating cancer teaching in medical education. Co-

ordination is best achieved by an interdepartmental committee which obviates the necessity for any individual to cross departmental lines. While there is no single means by which the objectives embodied in the present day philosophy of cancer teaching may be achieved, certain principles of approach have been reviewed.

CONCLUSIONS

1. There is, at present, no perfect method for modern cancer education. Technic must be varied according to the needs of the particular institution.

2. The program for cancer teaching must have the fundamental objectives and principles which experience has taught to be the foundation for success.

3. Periodic review and evaluation of the given program are of paramount importance. They are necessary to bring about further improvement.

4. It is to be anticipated that continuing efforts will substantiate the present concept that cancer may be controlled, to a great degree, by making every doctor's office a cancer control center.

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Radioisotopes in the Diagnosis and Management of Cancer

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Radioisotopes find application in the field of medicine as a result of the radiations which they emit. These radiations are of the alpha, beta, and gamma order and have the ability to produce ionization which, in turn, makes possible both their detection and their use as therapeutic agents. Prior to World War II radioisotopes were utilized in medicine as a result of the development of the cyclotron by Lawrence.[1] The atomic energy program of the goverment during the war made available vast quantities of radioactive materials for civilian use through the Atomic Energy Commission. During the past 7 years both cyclotron-produced and reactor-produced radioisotopes have been employed in the diagnosis and treatment of neoplasms at experimental and clinical levels.

Of the many radioisotopes now available there are five which will be referred to in this paper. These isotopes conform to already established standards by reason of their half-life, the nature of the radiation which they emit, biologic factors directly influencing their use, and the economic features centering about their production.

Isotopes are useful in the field of cancer first as tracers, where they can be put to work in biochemical research, and, second in diagnosis and management of cancer. It is to this latter aspect that this paper is directed.

TUMOR LOCALIZATION AND DIAGNOSIS

Radioisotopes administered orally or injected directly into the blood stream in small doses have been widely employed both experimentally and clinically for the purpose of localization and diagnosis of tumors. Successful application of tracer methods in diagnosis is at present a relatively limited field. Part of the apparent failure of radioisotopes in diagnosis can be accounted for on the basis of failure of tumors to show adequate uptake and concentration of radioisotopes or, on the other hand, the lack of selectivity of the medium utilized, that is, its failure to concentrate in the tumor to a degree greater than in the surrounding non-neoplastic tissues.

Recent reports indicate the successful employment of di-iodo-fluoroscein in localization and diagnosis of brain tumors. Radioactive fluoroscein becomes concentrated in the tumor, the degree of concentration being dependent upon the cellularity and the vascular pattern of the neoplasm. The more malignant the tumor, the greater the radiofluoroscein concentration as determined by the Geiger-Mueller counter. Counts taken over multiple areas at the level of the scalp indicate the site of maximal concentration of the di-iodo-fluoroscein. According to Askenazy, Davis, and Martin,[2] metastatic carcinomas and sarcomas give the highest differential counts while astrocytomas and oligodendrogliomas give the lowest differential counts. These investigators reported a total accuracy of 95 per cent in the tests carried out on 340 patients.

Fluoroscein tagged with radiophosphorus has also been employed in the localization of brain neoplasms. Since P^{32} is a pure beta ray emitter and beta rays have a range of but a few centimeters, localization of tumors by external surface technic is not feasible. Therefore it is necessary to employ miniature Geiger counters introduced directly into the brain tissue to localize the tumor. This probing or searching procedure can be carried out when the neurosurgeon is preparing to remove the tumor. The same technic also makes possible the detection and location of residual tumor tissue which may have been overlooked during extirpation of a major tumor mass. Location of the residual tumor elements by means of the Geiger counter and the removal of these elements may prevent subsequent operative procedures and contribute to the survival and even cure of the patient.

Radioiodine has been employed in the diagnosis and treatment of various thyroid gland disorders including thyroid gland neoplasms. Frantz, Quimby, and Evans[3] have reported their experiences with radioiodine, pointing out the possibilities in the differential diagnosis of thyroid neoplasms through the use of I^{131}. These investigators found that adenocarcinoma of the thyroid would concentrate iodine while Hürthle-cell tumors, papillary carcinomas, and giant cell and spindle cell carcinomas failed to concentrate the element.

Other workers have reported wide variation in the ability of thyroid tumors to take up and concentrate radioiodine. The majority of thyroid cancers show but little uptake of the radioisotope. This feature of tumor behavior is probably largely the result of the cellular composition of the tumor and also the

metabolic differentials existing between the normal thyroid tissue and the tumor cells, in that the normal thyroid competes with the tumor cells in the uptake and concentration of radioiodine. These findings apply equally well to the detection of metastatic foci of thyroid origin. In some instances the thyroid neoplasm itself will fail to concentrate radioiodine while the metastatic foci show a functional uptake and their location can thus be detected by employing a Geiger counter. On the other hand, known or suspected metastatic lesions may fail entirely to concentrate the isotope while the primary tumor will display evidences of uptake.

Despite the apparent limitations to the use of radioiodine as a medium for detection of thyroid cancer, it should be employed whenever indicated.

Present literature carries numerous reports bearing upon the use of radiophosphorus in the field of cancer diagnosis. This radioisotope has been employed in the diagnosis of cancer of the breast and also in the diagnosis of neoplasms of the testes. However, investigation and evaluation of these procedures must be made before any genuine estimate of their value can be expressed.

Radiosodium, radiogallium, and other isotopes also have been used for tumor localization and detection. Radiogallium has been employed in the detection and localization of carcinomatous bone metastases. Wider usage and experience with these radioactive agents likewise is needed before any conclusions may be drawn as to their effectiveness.

TUMOR THERAPY

Certain requirements of an exacting nature are essential to the employment of radioisotopes in the treatment of tumors: (1) The isotope must be nontoxic in the doses required and free from toxic impurities or daughter elements. (2) It must not localize strongly in areas other than those to be treated. (3) It must have a short half-life so that radiation will not persist beyond the desired period. (4) Its half-life must be sufficient to permit conversion to useful forms and must outlast transportation time to the site of administration. (5) It must be capable of intensive and economical preparation. The radioisotopes referred to earlier in this paper meet these standards and requirements and a number of additional isotopes offer good possibilities for use when their biologic properties become better known and better understood.

Considering the success attendant upon the use of I^{131} in the treatment of hyperthyroidism it might be assumed that this radioisotope would prove equally successful in the management of thyroid cancer. However, only about 15 per cent of thyroid tumors take up iodine in sufficient quantity to warrant the use of I^{131} as a therapeutic agent. The reasons for failure of uptake have, in part at least, been accounted for in the portion of this paper dealing with the diagnosis of tumors. Further difficulty in establishing control of thyroid cancer rests in the fact that this group of tumors tends to fall into the so-called radioresistant category.

Radioisotope therapy in thyroid cancer at times may be enhanced and increased uptake in the thyroid tumor brought about by extirpating the normal thyroid tissue, by administering thyrotropic hormones, or by the administration of thiouracil, thus depressing thyroid function.

Case reports on use of radioiodine in the treatment of thyroid cancer indicate, in a few instances, survivals of 6 years. Other encouraging reports indicate healing of osteal metastases, disappearance of pulmonary metastases, and reduction in size of soft parts of metastatic tumors. There is, therefore, indication and need for use of radioiodine in the management of thyroid cancer based on proper case selection. The suitability of radioiodine in the treatment of the individual thyroid neoplasm must be ascertained through tracer studies with the isotope and the degree of cellular activity of the tumor estimated through the medium of autoradiography.

A radioactive isotope of the element phosphorus, radiophosphorus (P^{32}), was one of the first radioactive isotopes to be widely employed in the field of medicine. Phosphorus is essential in the synthesis of nucleoprotein and is therefore incorporated in tissues involved in accelerated growth and increased metabolic activity. When administered, radiophosphorus rapidly leaves the blood stream and is deposited in large quantities in bone and bone marrow and to a lesser degree in lymph nodes, liver, and spleen. Thus this radioisotope becomes largely concentrated in the hemopoietic system.

As a therapeutic agent radiophosphorus is best known for its use in the management of polycythemia vera where its therapeutic advantages are now accepted. Radiophosphorus has also been utilized in the treatment of both chronic myeloid leukemia and chronic lymphoid leukemia, largely because of the phosphorus metabolism and radiosensitivity of the hemopoietic tissues. Radiophosphorus has, in some instances, been helpful in the treatment of myeloid leukemia though the remissions reported have been no more successful than those obtained with roentgen ray therapy. Radiophosphorus has proved ineffectual in management of Hodgkins' disease and occasionally helpful in management of other lymphoid tumors.

Much of the work in radioisotope therapy has been based on the chemical identity of the elements employed. A departure from this approach has been undertaken in the development and use of insoluble colloid particles of varying sizes and forms. Radioactive colloids when injected into the blood stream may become localized in the reticuloendothelium system. They may, when introduced directly into tissue, follow the lymphatic pathways. When injected directly into a tumor, the colloids show a high degree of intratumoral retention permitting concentration of ionizing agents within the tumor for therapeutic purposes.

Hahn and Carothers[4] have pioneered in the use of radiocolloids, both experimentally and clinically. On the basis of their reports, great interest has been aroused in the application of colloidal gold, colloidal iodine, and colloidal chromic phosphate therapy.

Direct injection of radioactive colloids into the serous cavities of the body, such as the peritoneum, has shown that radioactive material is retained within the cavity, that the colloid particles mix freely with the peritoneal fluid, and colloid particles are enclosed in the cytoplasm of macrophages. Definite palliative effects have been obtained from this procedure in the management of widespread intra-abdominal malignancies such as carcinomatosis arising from primary ovarian cancer. One benefit derived from the intraperitoneal injection of radioactive colloids has been

the suppression of ascitic fluid accumulation without apparent damage to the surrounding tissues not directly involved in the neoplastic process.

Interstitial injection of radiocolloids in the management of tumors is, for the greater part, in an experimental stage. However, it is worthy of mention that this form of treatment has been applied to carcinoma of the uterine cervix. As yet no definite conclusions can be drawn as to the efficacy or to the advantages which such a procedure might hold.

The use of radiogold colloid in conjunction with the systemic administration of nitrogen mustard has been carried out experimentally in the control of tumors. One report[5] based on the combined use of these two agents indicates regression of sarcomas induced in laboratory animals. This report is cited to indicate that the combination of chemotherapy with radioactive isotope therapy may find usefulness in the management and control of cancer.

Radioisotopes have also been used in cancer as a substitute for radium, particularly where interstitial sources of ionizing radiation are indicated. Radiocobalt has been employed in this manner, because of its relatively long half-life and because it emits hard gamma radiations essentially of a monochromatic order. Radiocobalt can be prepared in the form of wire approximately 1 mm. thick which can be cut into suitable lengths for interstitial use. In this form radiocobalt has been applied in the treatment of cancer of the uterine cervix and also in the treatment of metastatic neck nodes. Radiocobalt can also be made up in the form of plastic thread. Because of the flexibility of its application, radioactive material would appear to offer certain advantages over radium as an interstitial method of treatment of cancer situated in certain anatomic locations.

Radiocobalt has also been employed in the treatment of neoplasms of the maxillary antrum, nasopharynx, and urinary bladder. In these instances the radioactive material has been used in the form of a cobalt bead or beads placed within an inflated rubber catheter of the Foley type. Again the advantages which might accrue from the use of ionizing radiations in this form are in the flexibility of application of the radioactive material as compared with radium therapy in similar neoplastic lesions.

Employment of radioisotopes as a source of external radiation in the treatment of cancer is now an actuality. In November 1951, the first cobalt 60 beam therapy unit in the world began operation at the Ontario Cancer Foundation Clinic, London, Ontario.[6] Cobalt beam therapy units of this type utilize over 2,000 curies equivalent of Co^{60} and because of the character of the gamma radiations emitted, assume a place in the field of radiotherapy now occupied by teleradium and supervoltage roentgen ray apparatus.

The various applications of radioisotopes in the diagnosis and treatment of cancer are for the most part in a preliminary stage of development. No accurate predictions can be made to their ultimate contributions in the field of medicine, but several advantageous uses for radioisotopes are now evident and others are developing. It seems quite likely that the greatest contribution to the field of cancer coming directly from the utilization of radioisotopes will be in the field of biochemical research. It is hoped that through research the usefulness of these new diagnostic and therapeutic tools may be extended and further developed.

SUMMARY

1. Radioisotopes have proved valuable in the diagnosis of certain tumors, chiefly neoplasms of thyroid gland origin and tumors located in the brain.

2. At present radioisotopes find clinical application in the management of neoplasms in a more or less limited manner, in the treatment of selected cases of thyroid carcinoma, polycythemia vera, and some of the leukemic states.

3. The use of radioactive colloids, particularly radioactive gold, and application of radiocobalt, as a means for interstitial and external radiations in the management of cancer, await further development and further evaluation.

4. Biochemical research may very well increase the scope of application and the usefulness of radioactive materials in the field of oncology.

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Salient Features of Skin Malignancies

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The purpose of this paper is to present a brief review of the clinical characteristics of the more common cutaneous malignancies, their nature and growth, and a few suggestions concerning their management. Cancer of the skin does not necessarily present a picture of gloom, fatality, and frustration, for with early diagnosis, its curability is nearly 100 per cent. It is fortunate that one of the most common of all malignant diseases appears upon the surface where early recognition is so easy and total destruction possible.

Although I believe that this percentage of curability cited above includes all malignancies of the skin, I am certainly mindful of the fatality of the sarcomas and lymphoblastomas. However, these tumefactions and infiltrations make up only a fraction of 1 per cent of all skin malignancies. Their recognition is not difficult providing you see the need for biopsy, the only accurate means of identifying them.

MALIGNANT MELANOMA

While malignant melanoma is not common it is certainly not rare, and it is probably true that it is on the increase. But is this not true of many other forms of malignant disease? Broders[1] gives its incidence as 5 per cent of cutaneous malignancies, but in my experience it has been less. The management of melanoma is a grave responsibility for poor as the prognosis may be, there is a time when it is still a local disease. It can be cured and the lesion is on the surface where it can be recognized early. In spite of these facts, cure is by no means easy.

Melanoma or melanocarcinoma is a disease of younger adults than carcinoma but no age is exempt. It even occurs in children, and it is interesting to note that in them it is not violently malignant and offers a much better prognosis.

The importance of location is often exaggerated as malignant melanoma is a lesion of any part of the integument in spite of its apparent predilection for the lower extremities. A lesion should be regarded with suspicion not because of its location but because of its character.

The role of irritation is difficult to evaluate. Trauma and irritation probably do not produce malignant change in a pigmented lesion unless it is potentially malignant. I have seen great numbers of pigmented lesions upon the palms and soles of individuals of all ages, and I am sure you have too. They have been walked upon, irritated, and traumatized for the entire lives of these persons. They simply do not have the ability to become malignant.

It is also true that partial or complete removal of a pigmented lesion does not produce malignancy in a lesion incapable of malignant change. When malignancy occurs after such a procedure it may have been present at the time of removal and not recognized. Certain benign pigmented nevi have been removed by nonradical methods for cosmetic reasons for years. These statements are not made to condone promiscuity in management of pigmented lesions for this can be fatal. Lesions to be treated by a nonradical cosmetic procedure should be selected with the care, caution, and experience of the expert. The great danger is the loss of an opportunity for cure of an early malignant melanoma.

Malignant melanoma may occur without a preexistent pigmented lesion but even so the cells which produce it were probably present at birth. The lesion able to produce a melanocarcinoma is the junction nevus; the cellular activity is at the epidermal-dermal junction. It is not produced by the more superficial intraepidermal nevus or by the deeper intradermal nevus. This of course is a histologic classification and the important question is, how can the junction nevus be recognized clinically?

First it may be helpful to state what it is not. It is not the rounded, elevated lesion called often "the common mole" which is a pigmented or nonpigmented fibromatous nevus. It is not the pedunculated nevus, the verrucous or cerebriform nevus, the hairy nevus, or the blue nevus. The junction nevus is a flat lesion with some elevation and varying in size from a tiny spot to large plaques. Its surface may be smooth or rough; it may be rough enough to resemble a verrucous nevus. Its color may vary from light tan through the deeper shades of brown to black.[2]

Suspicion of malignant change in a junction nevus is aroused by one or more of the following, which may occur in all or in part of the lesion:

1. Pigment change, either increase or decrease
2. Increased vascularity
3. Growth
   a. increase in size after remaining dormant for years
   b. development in later life
4. Bleeding or ulcerative change.

The suspicious lesion should be excised for biopsy. Excision should be complete and the lesion handled with care; it should not be squeezed or grasped with forceps. If malignancy is found, more radical surgery should be done. Melanomas are not radiosensitive and they become metastatic very early, often via the blood stream. Satellite lesions in the skin indicate their mode of spread through the superficial lymphatics. They spread as well through the deep lymphatics and make their appearance in the local nodes and then quickly go beyond these barriers. Wide extirpation of the primary lesion very early is the only real chance of cure.

As for the more radical procedures of block gland dissections and vast areas of skin stripping, much has been said both for and against. These problems will not be discussed here, but I have given much thought to them and my present opinion is away from these more radical surgical procedures except in certain carefully selected cases.

METASTATIC CARCINOMA

Secondary or metastatic carcinoma of the skin will be only referred to here. However, it may be the first symptom for which the patient consults the physician or it may be the first absolute proof of a

suspected internal carcinoma. Metastatic carcinomas commonly make their appearance upon the trunk and may be single or multiple. They appear as deep lying nodules, very dense and firm on palpation; they are skin color to pink; and they produce a rounded eminence usually about the size of a small pea when first noticed. At times they may be plaque-like growths. Their true nature may or may not be suspected, depending upon other symptoms of internal carcinoma. They are readily removed for biopsy.

PAGET'S DISEASE OF THE BREAST

Paget's disease of the nipple is usually an extension carcinoma from a primary carcinoma of the breast or lactiferous ducts. It is a plaque of varying size, either exudative or dry, and resembles an exzematous plaque. The breast is one of the occasional sites for localized neurodermatitis and differentiation is difficult for the expert. It would certainly be a grave error to remove a breast unless positive histologic evidence was obtained. The breast and duct area should be carefully palpated. Tissue should be selected for biopsy from a thickened portion of the plaque and from any deeper nodule. Since Paget's disease of the nipple is virtually always an extension carcinoma its proper management is complete removal of the gland.

EPITHELIOMA

Primary carcinoma (epithelioma) of the skin is the lesion which accounts for 95 per cent of skin malignancy. It has the greatest incidence of all carcinomas in the male. In the female it ranks fourth being exceeded by carcinoma of the breast, uterine cervix, and colon. Ackerman and del Regato[3] report that skin carcinomas constitute 40 per cent of all carcinomas seen in their clinic where mostly rural workers are seen. The age for epithelioma starts at 40; 90 per cent of lesions occur after this age but it should be noted that the 10 per cent occurring before age 40 constitute a sizable figure.

The vast majority of these lesions are located on the face and are prone to occur in the fair-skinned peoples, particularly those exposed to the continued irritation of the sun's rays. One of my patients was a shipyard worker who had seven epitheliomata on the back of the neck which had been exposed to the sun for years. Another was a fair-skinned bald man, who had typical radiodermatitis of the scalp due to long exposure to and repeated burning by solar rays and ulcerative epitheliomata, literally too numerous to count. Carcinoma is also frequent on the lip, the dorsum of the hands, and the external genitalia. It occurs on any part of the integument and the buccal cavity.

Cutaneous carcinoma arises almost always from the epidermis and only occasionally from the epithelium of the glands of the skin. While basal cell epithelioma is a nonmetastatic lesion it may, if neglected, attain great size, cause tremendous destruction and become uncontrollable and incurable. It is of course the nature of the squamous cell epithelioma to become metastatic. The period during which the lesion remains local and can be cured by complete destruction is variable for each individual lesion and each location. Lesions on the face, the most common site, are slow to become metastatic. In many of my patients lesions proved on biopsy to be squamous cell type, have remained a local disease for a year or longer. An average of 6 months until metastasis occurs, as stated by some authors, seems short.

There is of course the occasional anaplastic type, growing rapidly, and with metastasis occurring in weeks. Therefore, no time should ever be lost; days count. While there is variation, metastasis is not rapid from any of the common sites including the mucocutaneous lip lesion. Metastasis is early in mouth lesions with the exception of the anterior tongue. Mouth lesions are often anaplastic and the cure rate very low even though they are seen early. It is the tendency for cutaneous carcinoma of the face becoming metastatic to the cervical glands to be blocked for a period in these glands. This characteristic makes it possible to tie it to this site by irradiation or to remove it by block dissection, whichever may be indicated. This is not a characteristic of melanoma in any location.

Multiple epitheliomata are quite common and they may be of basal or squamous cell type. This does not mean that they have spread from a primary site by extension through cutaneous lymphatics. They are multicentric, each representing a primary carcinoma. This development is different from that of melanoma which usually produces cutaneous satelites via the lymphatics.

It is possible to differentiate clinically between basal and squamous cell epithelioma, but not with any high degree of accuracy; further, some lesions will be mixed—basosquamous. No effort therefore will be made to differentiate the two lesions by clinical appearance. Various statistics give the incidence of squamous cell lesions as 15 to 25 per cent; the majority are basal cell. If the lesion is in the mouth it is always the squamous cell type and it is usually this type if it is located on the mucocutaneous junction of the lower lip, on the hands, the extremities, or the external genitalia.

A majority of cutaneous carcinomas develop on skin which appears normal. A lesser number are superimposed upon a so-called precancerous lesion and are usually but not always squamous cell in type.

PRECANCEROUS LESIONS

Perhaps the most important of the precancerous lesions are senile keratoses. These lesions are small dry scaly spots several millimeters in diameter. The base may show increased vascularity. There may be a few or they may appear in great profusion upon skin which shows senile atrophy. They occur on skin exposed to sunshine through the years—on the dorsa of the hands and forearms, the face, et cetera. Such skin should be examined carefully as a part of periodic health examinations, and all keratotic lesions showing signs of change should be promptly removed either with or without biopsy. Signs include increased vascularity, replacement of scale by a crust, bleeding, or elevation on a cellular base.

Seborrheic keratoses are very common after the age of 40. They may be few in number or may occur in great profusion. They are common upon the back, chest, face, neck, and scalp and may extend to the arms. They vary in appearance and in circumference from several millimeters to several centimeters. They may be round—many are oval in shape and appear with bilateral symmetry, with the long axis if ovoid lesions in the direction of the body somites. Their pigmentation at times leads to their classification with moles or nevi which they are not.

A new lesion is flat, but slightly elevated, usually a light yellow-brown color, and may be covered by

a scale which is oily. Some become larger and acquire deeper brown or black pigment. The lesion may rise to the point of being a considerable tumor. The surface may become rough or even actually verrucous. They may be called seborrheic keratoses, pigmented keratoses, verrucous keratoses, et cetera.

It is certainly impractical to remove all lesions in patients who have great numbers. Cancerous change is not frequent as it is in the less conspicuous small senile keratoses. If change, indicated by growth, bleeding, crust, or ulcer occurs, the lesion should be removed and a biopsy done. These lesions are frequently removed for cosmetic reasons or because they become irritated or a nuisance. They are best removed with a small sharp curet. If there is any question of malignancy, tissue can be submitted for biopsy. After curettage the surface should be very lightly fulgurated.

Chronic radiodermatitis and chronic actinodermatitis are fertile soil for the development of carcinoma; always the squamous type. It is not easy to recognize chronic radiodermatitis. Cases of long continued occupational dermatitis, chronic exzema, chronic dermatitis in the vicinity of discharging ulcers or fistulae, and a number of less common diseases can so closely imitate radiodermatitis that they defy accurate diagnosis. In radiodermatitis the skin is dry, atrophic, and has a peculiar mottled appearance—areas of depigmentation, spots of pigment, telangiectasia, and here and there perhaps keratoses. It is the small scaly or vascular spot which must be watched for erosion, crust, bleeding, or growth.

When change occurs the best treatment is thorough removal with a curet. When skill in the use of a curet is acquired it is possible to find and remove all of the epitheliomatous change as is necessary in this type of lesion. This lesion invades surrounding atrophic integument in an insidious fashion so that the limits are not clinically apparent until the curet is used. When healthy tissue is reached, an area beyond is destroyed by electrocoagulation.

I do not agree with those who state that epithelioma in chronic radiodermatitis has a poor prognosis. That is true when it becomes advanced or metastatic, but there is a time when this change is a small spot. I have never seen a failure to cure small lesions, and some patients have had a number removed over a period of years. The patient must be taught what to look for and to attend to it promptly.

Leukoplakia or leukokeratoses are white plaques of varying size occurring on mucosal surfaces. They are common upon the tongue and lips. All irritation should be avoided such as may be due to tobacco, dentures, bad teeth, et cetera. Whenever feasible an area of leukoplakia should be completely removed, preferably by electrocoagulation. Malignant change is a possibility when any portion of such a lesion becomes thickened and hyperplastic. If this occurs the entire area should be removed and biopsy done.

Various benign tumors, nevi, scars (particularly burn scars), and any of a number of chronic inflammatory dermatoses may at times undergo malignant change.

It is of course not difficult to recognize advanced skin cancer. To find early and curable skin cancer the laity has been taught to suspect any small growth, small crust, or spot of bleeding—in fact any lesion which does not get well in 2 weeks. Carcinoma may be recognized when only a few millimeters in diameter, but most have acquired a size of 0.5 to 1.5 cm. before they are seen for treatment.

The clinical appearance of epitheliomas varies. Many ulcerate early so that any small ulceration is suspect. All tend to ulcerate sooner or later. Increased vascularity is observed. Many will have a very characteristic waxy translucent appearance and through this translucent appearing tissue a few telangiectatic vessels may be observed. Growth of cancer cells may be uniform presenting a smooth rounded eminence. This type may become quite elevated or hypertrophic. Growth is more often uneven and whether the lesion is ulcerative or hypertrophic it will then present papules or nodules in some portions. Marginal activity at times becomes great, producing the rolled elevation or ridge at the border. This rolled border may partly or completely encircle; it is very apt to show the translucent waxy appearance; and it may or may not be papular.

Some epitheliomata will be flat plaques. This type is more difficult to recognize than others but if such tumors show in any part a crust or bleeding point they become immediately suspect. Small translucent papules may be seen in such plaques, particularly if it is wet with oil or alcohol. Certainly such lesions which do not respond promptly to treatment should be investigated.

Squamous cell epithelioma in some areas may imitate a common wart—particularly on the hands. Regard with suspicion the "wart" on the finger, hand, forearm, and genitalia of older patients, particularly on skin showing senile atrophy and keratoses. Ask yourself whether it is a bit atypical and whether it has a rather vascular base? If inadvertently such a lesion is fulgurated it will not heal in the customary 2 weeks and begins to show hyperplastic change. It must receive appropriate treatment promptly.

THERAPY

It has been stated that no patient should die of carcinoma of the skin. In making this statement carcinomas of the buccal mucosa must be excluded since they are anaplastic and metastasize very early; all other areas such as the face, lip, external genitalia, and extremities may be included. Failure to cure a primary carcinoma of the skin is due to neglect or to inadequate treatment. It is axiomatic that early diagnosis and adequate treatment result in cure.

Curative treatment then depends on complete removal or destruction of the primary lesion. A lesion may be destroyed with x-rays or radium or it may be surgically removed. Surgical removal includes excision, electrosurgical removal, or the combined use of the two methods. It is quite common to combine removal with irradiation to the site. There is no best method of treatment for all lesions; but there is usually a treatment of choice, a plan which is best, for a particular lesion. However, several plans may be equally good for certain lesions.

The following is a brief presentation of factors to be considered when planning therapy. Examples are given by way of explanation and to direct attention to a plan of thinking and the reasons for it, but there is no attempt to cover all circumstances.

1. *Histopathology.*—Biopsy is seldom necessary for diagnosis of epithelioma, since nearly all lesions may be recognized on examination, but there is another

purpose—biopsy will classify the lesion as basal or squamous cell, anaplastic, or well differentiated.

The cancericidal dose of rays varies with basal or squamous cell lesions. Methods of removal and of course management of a possible metastasis may be influenced by the results of the biopsy.

2. *Size.*—Determination of surface area, depth, and whether or not a lesion is hypertrophic or invasive is quite important in the determination of x-ray dosage. A lesion which is very hypertrophic may be completely removed or it may be removed to the surface and then irradiated instead of depending on irradiation alone. Very large lesions in some areas may require plastic repair.

3. *Site.*—Locations over cartilage or bone, and on the scalp, eyelids, external ear, auditory canal, lip, hand, penis, scrotum, et cetera, all offer special problems.

Lesions located over cartilage or bone often are not good sites for irradiation therapy particularly if the deeper tissue has been invaded. The scalp is a poor area for irradiation. Eyelids offer the problem of eye protection when irradiation is used and if the lesion is large may require plastic repair. A hand lesion may be removed electrosurgically or excised. A scrotal lesion should be excised. If a penile lesion is small, freely movable, and the fascia not invaded, it may be removed by curettage-electrosurgery; if these criteria are not met the penis may be amputated and the local lymphatics removed or irradiated. A lesion of the auditory canal is best treated by radium needle.

4. *Previous Treatment.*—Unsuccessful attempts at removal or previous irradiation must be considered. The lesion may be radioresistant; if so a higher cure rate will be attained by its removal. In the presence of scar tissue, removal, particularly with a curet, is preferable to irradiation.

5. *Curability.*—The disease may not be curable because of metastases or extensive invasion. In such cases management is palliative.

6. *Age or Physical State of Patient.*—Aged and rather feeble patients may be given single-dose x-ray therapy in conditions where fractionation and cancericidal doses would be used in younger or more vigorous patients.

7. *Cosmetic Results.*—While cosmetic results are secondary to cure, they are important. If the cure rate is the same, the procedure should be chosen which offers the better chance of a good cosmetic result. In some areas it is difficult to obtain a good cosmetic result by any method. In other areas a good result may be obtained by various methods.

I do not think it true that the best cosmetic results are obtained by irridiation or by any one of several methods of removal. I think the best cosmetic results are obtained by skill in application and by proper choice as suggested above. Very few cases require plastic repair, and as a rule repair is best after cure.

SUMMARY

1. The clinical features and diagnosis of the precancerous and cancerous diseases of the skin have been discussed.

2. Some sailent facts concerning the character of these lesions and their management have been presented.

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Biopsy and Cytologic Studies in Cancer Detection

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The study of cancer by microscopic means dates back to the seventeenth century. The Egyptians, Persians, and Indians knew of cancer and dealt with it as early as 1500 B.C. But it was Anton van Leeuwenhoek[1] and his contemporaries who made examination of neoplastic tissue possible by developing the microscope. In the development of microscopic anatomy or histology that followed, Malpighi[1] should be mentioned for his tremendous work. Schwann[1] furthered microscopic anatomy study by his development of the theory of cellular structure, and Johannes Müller[2] must be mentioned for his classical study of malignant tumors.

In more modern times the work of Ewing[3] has been outstanding. Of the contemporary researchers, Papanicolaou[4] is notable for his studies in exfoliative cytology in the study of cancer and cancer detection.

Biopsy, the excision of live tissue to establish diagnosis by means of its microscopic examination, constitutes the only reliable means of diagnosing malignant neoplasia. Only a few examples are needed to establish proof of this fact. One of the outstanding examples is the differentiation of fat necrosis of the breast and carcinoma of the breast. It is all but impossible to differentiate the two clinically despite adequate clinical history, maximal skill in physical examination, and other diagnostic adjuncts. In fact, many times the differentiation of fat necrosis and carcinoma is a difficult differential problem for the pathologist.

The amelanotic melanoma may occur about the face and be mistaken for epidermoid carcinoma of skin and the location may be such that high voltage x-ray therapy is utilized. However, irradiation of a malignant melanoma will have little or no effect upon it because of its radioresistance and thus the patient may well lose his life.

The youth with a history of an ankle or shin bump, where swelling and an area of fluctuation beneath which purulent-like material develops, may well be suffering from Ewing's sarcoma of bone rather than osteomyelitis. Cultures made of the material may or may not be sterile, but nevertheless the diagnosis is still in doubt until some form of biopsy has been utilized.

Many other confusing lesions in superficial as well as deep and remote locations make gross and clinical evaluation extremely difficult and inaccurate as indicated in studies of Willis.[5] Biopsy is the only known method by which evaluation can be as accurate as humanly possible. It is a necessity for statistical evaluation of the incidence of cancer, studies of hereditary backgrounds, trends in the rate of development, and of the effects of treatment. Certainly at present cancer data based upon cases in which diagnosis has not been substantiated by biopsy and/or exfoliative cytology cannot be considered valid.

The contention that biopsy is a dangerous procedure which produces spread of cancer or metastasis cannot be completely denied. Certainly it has its limitations. In vascular tumors such as osteogenic sarcoma of bone, an extensive biopsy carried out with rough and undue manipulation or even in the most careful fashion followed by a delay of several days or weeks, may open pathways of spread and metastasis. However, this is not a defect of biopsy as a method but is rather misuse of a method. Too many physicians have the attitude that biopsy consists merely of obtaining a small bit of tissue from about, out of, or around a tumor mass, and that the fragments may be of any type. The specimen may be obtained by tearing, cutting, or scraping and frequently is unsatisfactory.

Often the specimen is submitted with a minimum of information and the pathologist can only report necrotic or inflammatory debris, et cetera, despite the fact that a malignancy may exist only a few millimeters away from the biopsy site. Thus, the patient either is subjected to the additional discomfort and hazard of another biopsy or the attending physician and the patient are lulled into a false sense of security by the so-called "negative biopsy."

Biopsy is not an innocuous, haphazard procedure but should and must be carefully planned and executed. For maximum results and salvage of patients, the biopsy procedure must be planned, taking into consideration the limitations of the pathologist who is to make the diagnosis and the problems of the radiologist and the surgeon who later must be responsible for the treatment of the patient. Since cancer is a disease process which in the majority of cases cannot be managed by a single physician, treatment requires teamwork among the attending physician, the pathologist, radiologist, surgeon, orthopedist, dermatologist, internist and others as necessary. Biopsy should then be the cornerstone upon which these individuals base their attack upon cancer. The procedure can be a danger and detriment to the patient or it can be the first step in reclamation or cure. To discharge fully his duty to the patient, the physician must plan biopsy procedure with the help of a cancer team and with the realization that success or failure depends largely upon him since time is such a valuable factor in cancer therapy.

The technic of biopsy belongs to the field of surgery. However, the pathologist sees the histologic effects of biopsy and also witnesses much of the confusion arising from technical difficulties and thus may advise upon the procedure. Three general rules should be observed in conducting the biopsy procedure. First, living tumor tissue must be obtained. This calls for careful inspection of the lesion and may require the careful removal of covering debris. Generally a biopsy fragment that extends from the tumor into the adjacent normal and surrounding tissue is adequate and most satisfactory. Frequently the central portions of major tumor nodules and even smaller tumors have outgrown their blood supply and are necrotic, whereas the outer portions are actively invading adjacent tissues and contain viable cells of diagnostic importance. It should be emphasized that necrotic tissue, dirty overlying debris and crust, or discolored soft necrotic or liquefied central portions of a tumor mass will yield little or no information about the nature of underlying tissue.

The second general rule is that biopsy should be performed with the sharpest cutting instrument possible as badly crushed tissue is of little value in diagnosis. The instrument that is used to grasp the tumor as well as the instrument that is used for excision must be chosen carefully. Crushing forceps of any type if clamped across the entire biopsy specimen will burst the cells between the jaws and destroy them. Therefore, the biopsy fragment must be picked up by a corner or side so that the major portion of the fragment is left untouched. A strand or two of suture material placed into the area of biopsy can be utilized as a very satisfactory retractor with little or no damage to the biopsy fragment.

There are many biting biopsy forceps, punch biopsy instruments, and knives which produce good specimens. These, if carefully sharpened and properly used will produce a specimen of the desired nature. In extremely vascular tumors hemorrhage is often a major problem. Here the endotherm knife is satisfactory if used with the knowledge that the heated cutting element cuts by the incineration of adjacent tissue and that much of the heat is dissipated to that tissue, producing a "cooking" which is as destructive as crushing. Thus a biopsy fragment excised by this means must be larger than one removed by sharp dissection.

The third general rule concerns careful preservation of the biopsy specimen. Biopsy may be carried out with perfect technic and with the collaboration of a tumor team but if the biopsy specimen is not handled and preserved carefully, nearly all the effort has been wasted. The most frequently used fixatives or preservatives are 10 per cent formalin or Zenker's formol solution. However, since the pathologist may prefer another fixative, he should be consulted. Some surgeons utilize sterile specimen containers to facilitate fixation of minute fragments such as those from the bronchus, esophagus, and gall-bladder which require immediate fixation. Saline solution definitely is not a preservative or a fixative as tissues at room temperature in saline rapidly disintegrate. In an emergency, it is recommended that the specimen be refrigerated but not frozen. Isopropyl alcohol or rubbing alcohol can be used in an emergency and also prevents drying which may be a problem in refrigeration. However, isopropyl alcohol hardens the tissues to the extent that often the fragment may not be cut successfully on the microtome.

A fourth general rule, less important except in certain locations, recommends excision of several biopsy fragments. In extensive lesions or in dealing with large visceral expanses, small fragments taken from several locations usually give much more information than a single fragment. This applies especially in a location such as the uterine cervix. Foote and Stewart[7] demonstrated by serial sectioning of the

uterine cervix that four small fragments taken from the four quadrants of the external os of the cervix would reveal nearly all malignancies arising in the cervix whereas a single fragment taken from one margin of the external os would show fewer than one half of early carcinomata. Thus several small biopsy fragments can be and usually are more valuable than a single large fragment from one location.

Specialized means of biopsy are employed in diagnosing various deep seated malignancies. Aspiration biopsy is very satisfactory for diagnosing deeplying carcinomata. Aspiration biopsy requires skill on the part of both the physician aspirating a lesion and the pathologist since minute fragments or small clumps of cells are obtained. Upon it depend the methods of irradiation and surgery utilized in completing cancer treatment. At Detroit Osteopathic Hospital the process of frozen section is utilized far more frequently than aspiration biopsy. Again teamwork is needed between pathologist and surgeon as well as the attending physician. Frozen section (in our case the 6 minute type) is difficult to interpret and in instances of extremely difficult interpretation the patient is returned to bed until paraffin section can be studied and reported upon. Frozen section is also utilized in our hospital for tissues generally not recommended for examination by this rapid method. Endometrium and transurethral prostatic fragments occasionally are examined with full understanding between pathologists and surgeons that, since only one or two fragments of many are being examined, the frozen section may give a false negative result. This again points out the necessity for a formal or informal cancer or tumor team. Another specialized form of biopsy is that obtained by the Vim Silverman needle which is utilized frequently to demonstrate deeply lying liver tumors when serum alkaline phosphatase and other liver function tests suggest the diagnosis. We repeatedly demonstrate tumors in this location in cases where the secondary or metastatic tumor overshadows the obscure primary tumor. These specialized methods of biopsy modified and adapted, along with the method of exfoliative cytology, are necessary for early cancer diagnosis and proper treatment.

Exfoliative cytology or the study of exfoliating epithelial cells has proved its worth in diagnosis of remote and deeply lying tumors. Carcinoma of the kidney, lung, bladder, prostate, pleura, peritoneum, stomach, pancreas, uterus, uterine cervix, colon, and rectum may be found or suspected at an early stage by this method. The method has advantages and disadvantages as well as specific requirements. Teamwork is required. The attending physician must cooperate with the pathologist and his technicians if the results are to be satisfactory. There must be some understanding of the pathologic physiology and of the technical limitations of the pathologist. Several simple and general rules may be enumerated for the procedure when the proper equipment has been obtained.

The equipment should consist of special aspirating instruments, preferably special scraping instruments as developed by Ayre,[8] protein sponges as recommended by Gladstone,[9] glass slides, and a fixative of one half alcohol and one half ether. The primary concern should be to prevent contamination of body fluid. For example, in an instance of suspected carcinoma of the cervix the patient is carefully instructed not to douche before the procedure is carried out. The examining physician must not introduce lubricants into the vaginal tract before smears are made. By observation of these same precautions dilution of bronchial secretions with saline et cetera will be prevented and a higher degree of accuracy obtained. Smears should be made from fluids directly covering the suspected area. The further away from the lesion the fluid is taken, the less likely it is that cancer cells will be found. Thin smears should be made promptly. Body fluids allowed to remain in a pipette or upon a cotton swab or scraper will rapidly disintegrate and dry with loss of the delicate staining qualities which are relied upon in this method. The slides should also be fixed immediately for the same reason. The cellular elements, spread thinly upon a slide, dry rapidly and disintegrate rapidly. Intricate details, especially of the nuclei but also the staining characteristics of the cytoplasm are lost or distorted by delay in fixing. Use of the simple rules dictated by necessity in this method will obtain accurate results.

Exfoliative cytology is accurate to the extent of 90 per cent or more in the hands of well-trained tumor teams. Here the attending physician is again an important man and must follow the limitations of the procedure if such accuracy is to be obtained or maintained. The 10 per cent error in the method is due in part to the fact that many types of cells are as yet unknown[10] and to the fact that exfoliation of cells does not occur at a constant rate.[11] Thus a negative smear for tumor cells is of little more significance than a single negative sputum specimen when tuberculosis is suspected. A negative smear means only that no distinctive cancer cells were present upon that particular slide. Since false positive and false negative reports do occur to the extent of 10 per cent, this method requires the use of biopsy to substantiate diagnosis.[12]

Despite this margin of error exfoliative cytology is of tremendous significance since it can be utilized so well for the detection of early curable carcinomas. Tumors of the lung, stomach, pancreas, esophagus, kidneys and lower portions of the urinary tract, uterus and its cervix, colon, and rectum all can be found by this means. It can also be utilized for the screening of asymptomatic patients to demonstrate not only early clinical carcinoma but carcinomata in their earliest incipient stages.

Exfoliative cytology has its disadvantages in that it is not as accurate as biopsy and that as a screening process for asymptomatic patients it is extremely costly both in terms of money and in terms of the time of the screening technicians and the pathologist. These disadvantages, however, are offset by its outstanding value in the study of early cancer or cancer in situ. The entire conception of the development of carcinoma has been modified by use of this method. For instance, it is now believed that tumors such as carcinoma of the uterine cervix develop as intra-epithelial tumors that may remain in this state as long as 4 to 8 years or longer before invasive full-blown clinical carcinoma develops. Such a conception of carcinoma offers new hope for cancer victims through early screening by this method.

SUMMARY

Biopsy is the only reliable means of accurately diagnosing malignancy. It should be used in a preplanned fashion by the attending physician who is conscious of the fact that he is the first man on a

cancer team. If so used, biopsy will not be hazardous or misleading. Exfoliative cytology is a somewhat tedious method of cancer detection but is of tremendous value because it can be utilized for the detection of incipient carcinoma in asymptomatic patients and early carcinoma in symptomatic patients with remote and deep lying tumors. At present the latter method is about 90 per cent accurate but requires confirmation by biopsy before radical surgery and/or extensive irradiation is carried out. Exfoliative cytology should be utilized along with biopsy so that early cases of carcinoma may be demonstrated and the rate of salvage of patients with malignant disease increased.

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The Surgical Approach to the Cancer Problem

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Think of cancer—just *think* of it! The fate of the patient with cancer depends to a very considerable extent upon the alertness of his physician. Does he *think* of cancer when the patient first comes to him with a complaint?

The value of surgery in the treatment of cancer is being widened each year. Operative procedures directed toward the cure of patients with cancer are being developed to include regions hitherto considered unapproachable. These include surgery for primary carcinoma of the lung, removal of sections of the esophagus, total gastrectomy, colon surgery, and the development of high voltage roentgen radiation and radium therapy, together with the newer atomic materials, such as isotopes, which today are being used in many research centers.

When one lives with the problem of cancer, as does the general surgeon, he cannot fail to be impressed with the fact that he rarely sees a patient with cancer where warning signs or symptoms have not existed unheeded for a considerable period. What excuse is there for any patient, much less any doctor, to permit an ulcer of the lip, tongue, cheek, or gum to exist unhealed for a period of over 3 weeks? What excuse is there for the continued observation of ulcers of the greater curve of the stomach, or of the prepyloric region of the stomach, or for bloody stools or abnormal vaginal bleeding to exist?

CANCER OF THE LUNGS

Primary carcinoma of the lung presents a field in which advancement has been made. More than ever before, attention is being directed to the amazing increase of lung cancer until now it appears to be one of the most common cancers in the male. It occurs even more frequently than cancer of the stomach. Cigarette smoking and the increased promiscuous use of antibiotics in diseases of the chest appear to be especially significant explanations for this increased incidence. Many times virus pneumonia or a chronic bronchial disturbance has been treated by antibiotics, giving temporary relief, and 6 or 8 months later the physician gets around to x-rays, bronchoscopy, and other studies essential to the correct diagnosis of lung tumor. Why? All because the doctor did not *think* of cancer. You ask, what can be done if the patient does have a bronchogenic carcinoma? Ochsner[1] says that out of 1,000 cases of proved bronchogenic carcinoma, 30 per cent are placed in the curable class and 42 per cent have survived 5 years. But such cures will not come about until you, the practicing physician, *think* of cancer every time you have a patient with a chest complaint, particularly a male of cancer age who is a heavy smoker.

CANCER OF THE BREAST

In the breast, obvious cancer is late cancer. During the early stages no growth can be seen nor is there pain; usually there is only a small lump or thickening in the breast. The woman can find that lump more easily than her physician. It would be wise for the physician to teach his female patients how to look for breast abnormalities. They should be instructed to examine breast tissue for lumps several times a year, and should be informed that most lumps are *not* cancer, although some of them are. This would probably send more patients with early breast cancers to doctors than any other one method. If the informed patient does discover a lump in her breast, the responsibility then rests with the physician. He must *think* cancer and must detect it with his fingers. Nine-tenths of all breast cancers can be palpated by the physician. Hence, a clinical diagnosis is established simply by a suspicious attitude on the part of the patient and proper thinking and examination on the part of the doctor. But in spite of constant propaganda by magazines, newspapers, et cetera, patients are still seen with advanced malignant tumors of the breast who have previously consulted physicians and have been reassured that the tumor could be watched safely

unless it grew larger or produced pain. In my opinion, every breast tumor, no matter what age the patient may be, should be excised and microscopic studies made to determine if malignant change is present. There is only one reliable way to diagnose cancer properly in any part of the body; that is by microscopy conducted by a competent and capable pathologist.

Carcinoma of the breast is a curable disease, and there has been improvement in the end results by radical operation since the introduction of radical mastectomy by Halsted[2] in 1882. The principles of radical mastectomy have been farily well standardized, but the number of 5-year survivals remains about the same, varying between 25 per cent and 40 per cent.[3] It remains to be seen whether this figure can be materially improved by the addition of high voltage therapy to radical operation.

The location of the tumor in a breast also is important. Fully 75 per cent of tumors will be seen in the upper-outer quadrant of the breast. Axillary metastasis is much higher when the tumor is in this location. Pain, ulceration, and nipple retraction are signs of advanced and late disease. The surgical approach to carcinoma of the breast is generally radical resection with removal of the pectoral muscles and thorough removal of all glands in the axillary space. Simple mastectomy also has a place in treatment of carcinoma of the breast; it is reserved for offensive ulcers of the breast with advanced metastasis; debilitated, poor risk patients; patients with severe cardiac disease; tuberculosis; et cetera. Practically all of my patients with carcinoma of the breast are given high voltage therapy beginning about the tenth or twelfth postsurgical day.

CANCER OF THE UTERUS

Carcinoma involving the fundus of the uterus is an entity in the field of cancer surgery which is of great interest to the surgeon, primarily because it is located ideally for operation and also because it is seen frequently at an operable stage. Carcinoma of the fundus is most often seen in older nulliparous women, either during or following menopause. It is not as common as carcinoma of the cervix. The symptoms of fundal or corpus carcinoma are, as a rule, rather standard in that they present a thin watery or bloody vaginal discharge, but massive hemorrhages are unusual. In the early stages, when the disease is confined to the endometrium, there is little or no pain. As the disease progresses, backache may be a pertinent symptom.

Physicans often tell patients who have fibroids of the uterus that they may become malignant. I cannot support this because cancer of the corpus springs from the endometrium. In many cases of uterine carcinoma there are associated or coincidental fibroids, but seldom do they arise from the tumor itself. Again, the physician must *think* cancer. Far too many women have been given androgens for uterine bleeding, or estrogens for menopausal changes, when they should have had a diagnostic curettage to rule out the possibility of carcinoma.

Once the diagnosis of fundal carcinoma has been made, the surgeon should be prepared to institute immediate treatment. I employ frozen section biopsy, and if it is found positive, radium is inserted immediately into the uterine cavity. This is followed by total hysterectomy and removal of both tubes and ovaries in 30 to 45 days. If glands are found in the broad ligaments and along the iliac vessels, they too are excised. Following this, high voltage radiation therapy is given. Some doctors do not believe that preoperative radium application is necessary; they perform hysterectomy as soon as as the diagnosis is made and follow it by high voltage therapy. Only immediate and adequate therapy can be expected to reduce the mortality in this disease. Finding the lesion will depend on the family physician—by periodic pelvic examination of *all* adult female patients preferably twice, but at least once a year.

The surgical approach to cancer of the cervix varies not only with the ability of the surgeon, but with the geographic location in which he practices. In my opinion, the treatment of choice is a combined one, related intimately to roentgen and radium therapy. The results of this combined therapy compare favorably with those obtained by surgery, without the associated surgical mortality. For the past 10 years I have managed carcinoma of the cervix almost exclusively by high voltage therapy and radium. There are few exceptions; they are early, grade 1 lesions which are limited strictly to the cervix. (This grading is the classification of the American Radium Society and the League of Nations classification.) All other types are treated without surgery. I have been pleased with the clinical results and the number of 5-year cures which have been obtained in the management of a large series of cases.

And, again, there is only one positive diagnosis for cancer and that is by microscopy. I cannot stress biopsies too much. I have made it a rule, regardless of the patient's age, that biopsies are taken of the anterior and posterior lips and the endocervix. For the endocervical biopsy, a Gusberg type of biopsy forcep or punch is used. The cervix is not coned or cauterized without a biopsy being taken. I have been surprised on more than one occasion at finding a 25- or 27-year-old woman with carcinoma of the cervix presenting only a clinical picture of endocervicitis or erosion.

Biopsy must be done properly and tissues taken from the correct areas and properly preserved or they are of no value. Tissue for satisfactory biopsies should not be excised with an electrical instrument of any kind. To secure the best pathologic opinion, fresh cold-cut tissue is of the utmost importance. Carcinoma of the cervix, differing from carcinoma of the corpus, is seen in younger women, who have borne children and generally before the age of menopause. It is seen seven times more often than carcinoma of the fundus. Because of its rich blood and lymph supply, cervical cancer is more difficult to cure, but it *can* be cured if seen early and by your *thinking* cancer when you make a cervical examination. In my opinion, you are guilty of gross negligence when you do not thoroughly evaluate every woman who comes under your care, irrespective of what her chief complaint may be.

There are various tests which might be of value in the diagnosis of carcinoma of the cervix aside from actual biopsy. One method is taking scrapings from the cervix and applying them to a Gelfoam sponge, which is placed in formalin and sent to the pathologist. I, personally, use this method infrequently because of access to excellent pathologic opinion; therefore, I use frozen sections almost exclusively in my practice. Those who are not so fortunte, could

well learn the Gelfoam technic. The old Schiller iodine test may be used, but it is not recommended.

CANCER OF THE PROSTATE

The prostate is one of the most common sites for carcinoma in the male today. Fully 20 per cent of all men past 50 may be expected to develop carcinoma of the prostate gland. The surgeon has much to offer this patient, not from the standpoint of cure, but from the standpoint of control of morbidity and prolongation of life. Again, it falls within the responsibility of the general practitioner to be alert and cancer-conscious in examination of every male patient. The man past 50 who complains, not necessarily of urinary symptoms, but of backache, perineal discomfort, leg ache, et cetera is, in my mind, a candidate for prostatic carcinoma and should be adequately evaluated before any type of therapy is instituted. I personally can cite dozens of patients who have undergone manipulation and medical treatment for many months while a frank carcinoma of the prostate gland was being overlooked. This is not fair to the patient, and should be embarrassing to the physician.

Physicians must *think* cancer.

Unfortunately, carcinoma of the prostate is fairly well advanced before even the patient is aware of difficulty. By the time the disease produces symptoms, it is nearly always beyond cure, but can be helped by intelligent and adequate therapy. Diagnosis of prostatic carcinoma is generally made by simple rectal palpation. The next step is again biopsy, either by transurethral or transperineal needle biopsy. Do not forget that a prostatic carcinoma diagnosed by rectal digital examination can still give negative biopsy results from a specimen taken from the bladder side of the prostate, as the lesion many times starts in the posterior capsule of the gland. A serum acid phosphatase test which gives an elevation of over 3 or 4 milligrams, usually indicates bone metastasis. Hemolysis of blood will give a false reading. Therefore, a diagnosis of carcinoma should not be made on one examination.

By the time a diagnosis is arrived at, the surgeon has two, or perhaps three, procedures to follow. If the lesion is in an early stage, a perineal prostatectomy which may give some hope of cure can be performed. As stated before, the early diagnosis of cancer of the prostate is rare, and therefore a very small percentage of cases will be suitable for perineal prostatectomy. Suprapubic prostatectomy is entirely contraindicated as it is impossible to enucleate the glands by this route. Only if the patient is suffering from obstructive symptoms from his prostatic disease should transurethral resection be done. This is, however, the only means of giving relief to obstructive cases.

My personal opinion, which differs from that of many other surgeons, is that castration should be carried out as soon as the diagnosis is confirmed. Some surgeons prefer to withhold castration until definite bone metastasis is demonstrated by x-ray. My experience does not justify this attitude. All patients with prostatic cancer should be given some form of estrogen, preferably stilbestrol in 0.5 to 1.0 mg. doses daily for the rest of their lives. High voltage and radium therapy have no place in the management of prostatic carcinoma as it is resistant to radiation and fibrosis of the bladder neck and perineal discomfort are often distressing to patients undergoing radiation. The surgeon can offer little hope for cure in prostatic carcinoma, but he can assist in prolonging the patient's life and making it more tolerable and more comfortable. Educate your examining finger to *think* carcinoma of the prostate in every male past 50.

CANCER OF THE BLADDER

Carcinoma of the urinary bladder is curable if recognized early. Benign papillomas of the bladder can be removed, thus preventing malignant degeneration. A kidney may be saved if a bladder tumor is removed before the ureteral orifice becomes obstructed and thus a life may be saved before metastases take place. High voltage x-ray and radium therapy is important in the management of urinary bladder tumors and should be utilized in every case. In more advanced cases of bladder carcinoma, it may be necessary to transplant the ureters either to the skin or sigmoid colon, not only to control bleeding, but to make the patient more comfortable and to prolong his life.

It is most difficult to differentiate symptomatically bladder tumor from kidney tumor. Hypernephroma of the kidney gives few local symptoms and its first symptom many times is hematuria. When the tumor has progressed to the point that the kidney is enlarged, the disease is well advanced. Cystoscopy, intravenous urography, and retrograde pyelograms will assist in the diagnosis of renal or bladder tumors, but should be done by a roentgenologist and surgeon or urologist familiar with their interpretation. If such services are not available, certainly your films can be reviewed elsewhere by someone qualified to interpret them. Once the diagnosis is confirmed or suspected, surgical approach to the kidney is imperative, and if tumor is found, radical nephrectomy is indicated. Again, high voltage therapy postoperatively, and sometimes preoperatively, is of great value. These tumors can be cured if detected and operated in time, and if the doctor who first sees the patient with hematuria *thinks* cancer.

CANCER OF THE INTESTINAL TRACT

In recent years, the surgical management of patients with carcinoma of the large colon and rectum has been vastly improved, primarily because of better preoperative preparation, sterilization of the bowel with antibiotics, better anesthesia, and improved postoperative care. But in spite of the publicity given to the subject of cancer during the past few years, patients are still encountered frequently who have had symptoms for many months although they sought medical advice early in their disease. Treatment has been delayed because the significance of the symptoms has not been recognized and adequate investigation has not been made.

The earliest manifestation of carcinoma of the colon and rectum is melena. This is generally in the form of occult bleeding of which patients are not aware. Surface epithelial malignancies bleed early because of necrosis and degeneration of the tumor. Thus weakness and anemia may be the first symptoms noticed by the patient. Another predominant symptom in carcinoma of the colon and rectum is abnormality of the stool. Approximately 80 per cent of these patients present a history of bloody stools, some with mucus, others with an alteration in the size and shape of the stool. A large percentage will complain of some change in bowel habit, such as constipation or alternating constipation and diarrhea. Fully 70 per cent of carcinoma in this region will occur on the left side

of the colon, and two-thirds of those affected are males. Patients with carcinoma of the colon and rectum are generally between 50 and 70 years of age, but I have seen carcinoma of the colon in men 25 years of age.

Because of lymphatic drainage on the left side of the abdomen, such lesions metastasize relatively slowly and cure can be hoped for in a fair percentage of cases if diagnosed early. And what are the procedures for early diagnosis? First, a careful history must be taken on all patients who present gastrointestinal symptoms. A routine blood count will many times reveal secondary anemia. Remember that carcinoma of the colon is second only to carcinoma of the stomach in presenting marked secondary anemia. Stool examinations for occult blood should be done after the patient has been on a meat-free diet for at least 72 hours. Digital examination of the rectum in all patients will often immediately decide the diagnosis in a low-lying ampullar carcinoma of the rectum. Proctoscopic and sigmoidoscopic examination, and next a barium enema and x-ray evaluation should be carried out. Many times careful palpation of the abdomen will reveal a tumor mass in the region of the sigmoid, the cecum, or the transverse colon. The principal methods by which lesions in the colon and rectum can be diagnosed early are: (1) careful history, (2) digital examination of the rectum, (3) sigmoidoscopic examination of the rectum and sigmoid, and (4) x-ray studies of the remainder of the large bowel.

A surprising number of patients with extensive carcinoma of the descending colon and sigmoid will suddenly develop obstructive symptoms or even ulceration and perforation. One should be extremely careful in recommending x-ray examination of these patients and prescribing barium by mouth. It is most embarrassing to find a gastrointestinal tract blocked with barium proximal to the lesion, so in suspected cases of obstruction, barium enema should precede barium by mouth.

Surgery in these cases must, of necessity, be radical. Make-shift operations for local resection of tumors in the lower sigmoid and rectum should not be done if one expects to cure the patient. Many patients will object to colostomy but it is better to sacrifice the rectum and save a life. Life with a colostomy is not impossible; I have many patients with colostomies carrying on active occupations. However, they must be educated and carefully instructed in care of the colostomy. Resections of lesions, especially in the left colon, is undertaken even in the face of metastases.

CONCLUSION

It is, of course, impossible to cover in this brief discussion the many phases of surgery in the treatment of cancer. Many important sites, such as the ovaries, pancreas, bone tumors, soft tissue cancer, and others have not been mentioned. But, irrespective of location of the tumor, or the organ invaded, there are several principles which apply to all forms. The most important of these is that the general practitioner must safeguard the life of his patient by *thinking* cancer and first recognizing its possibility. Each doctor's office should be a cancer detection center. If cancer is to be controlled, diagnosis must be early and treatment radical. Always remember it is far better to sacrifice a limb or an organ than to lose a life.

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High Voltage and Radium Therapy in Malignancy

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Radiation therapy is recognized today as one of the most important weapons in the fight against cancer. It is little more than 50 years since the first attempts at irradiation of cancer were made. The most important pioneers in the field are Roentgen who discovered x-rays or roentgen rays in 1895 and Pierre and Marie Curie who discovered radium in 1898. The first physiologic effects of roentgen rays were noted on research workers who, being ignorant of the biologic changes incidental to overexposure, allowed themselves to become victims of radiation dermatitis. The dermatitis was most often manifest on the hands and progressed into radiation necrosis, multiple amputations, and finally death. This marked the beginning of a long and distressing chapter in the suffering of the roentgen pioneers who reported changes of the skin which were very similar to the effects of sunburn.[1]

One of these doctors, J. E. Gillman,[2] expressed the opinion that any physical agent capable of doing so much damage to normal cells and tissues might offer possibilities as a therapeutic agent in pathologic conditions in which pronounced irritative blistering, or even destructive effects, might be desirable. This idea was received with considerable enthusiasm and it was found that the pain from carcinoma could be greatly relieved by exposing the diseased part to the x-ray beam.

PHYSICAL CONSIDERATIONS

Radiation is a type of energy which occurs in two forms: (1) as electromagnetic vibrations which include light, roentgen rays, and gamma rays of radium, and (2) as corpuscular radiation, the most notable examples of which are the alpha and beta rays of radium and neutrons.

BIOLOGIC CONSIDERATIONS

The site of action of the radiation stimulus upon human and animal tissue is the cell. In general radiation therapy, either by roentgen rays or by radium,

depends upon the depressant or destructive action of the ray, the effect being governed by the specific radiosensitivity of cells and tissues.

The biologic effect of irradiation on the skin was the original basis of dosage measurement and the skin erythema dose was the standard used. During the past few years, however, the physical methods of measurement have reached such a high degree of reliability that today the dosage of x-ray is expressed almost exclusively in terms of physical units. The roentgen, the international unit "r," is used in reference to x-ray and gamma roentgens or milligram hours in reference to radium.

PRINCIPLES OF RADIATION THERAPY

X-rays possess the power of penetrating tissues and it is this property which is utilized in therapy. If superficial tissue is to be treated, long wave-length, soft irradiation is used. In deep-lying conditions short wave-length hard, penetrating rays are employed. With soft-wave radiation, more absorption occurs in superficial tissues, while with short-wave radiation, little absorption occurs in the superficial tissues, and a greater percentage reaches the depths.

A mixture of soft and hard rays in heterogeneous beam are produced by the x-ray tube. To increase the short-wave penetrating beam and decrease the soft-wave beam, filtration is used between the tube and the patient and the voltage of the tube increased. The filter, usually metal, absorbs a certain portion of the wave lengths produced. Alteration of penetration of the x-rays may be produced by changes in voltage, filter, size of field treated, and distance of the patient from the x-ray tube.[3]

The therapeutic properties of radium are similar to those of the x-ray and are employed in two forms: (1) radium element, and (2) radium emanation or radon.

RADIOSENSITIVITY OF TUMORS

The radiosensitivity of a tumor plays a paramount role in evaluating the radiotherapeutic attack on cancer. It often determines the selection of a mode of treatment, the choice between surgery or radiation, and together with other considerations, whether curative or merely palliative efforts are indicated in a particular case.

So far as is known today there is no difference in the biologic action between filtered x-rays and filtered radium rays. Radon and radium are equal in their biologic effects. The response of body tissue to irradiation in the normal, healthy state is different from that when a pathologic condition exists, and irradiation is more effective on neoplastic cells than on normal tissue cells.

The effect of irradiation on tissue is seen in changes in the nucleus and cytoplasm of cells, and large doses cause necrosis and destruction of both. Not all types of cells respond to irradiation similarly. The law of Bergonie and Tribondeau states that cells are most sensitive in their embryonic state, when mitosis is most active; therefore the more highly differentiated the cell, the less sensitive it will be to irradiation. Specifically it may be said that the more anaplastic or undifferentiated a cell, the more radiosensitive it will be. But it should not be assumed, therefore, that radiosensitivity is the same as radiocurability. The greater the degree of anaplasia in a lesion the more radiosensitive, but also the more malignant it is, and highly malignant tumors tend to spread themselves widely and to recur early. Recurrences may be extremely difficult to treat because they are usually more radioresistant than the original tumor.

The response of neoplastic tissue to irradiation depends upon several factors, namely: (1) the condition of the patient—the better the patient's general health, the more favorably the tumor will respond to radiation therapy; (2) the position and situation of the lesion—for example, an epidermoid carcinoma of the lung tends to be far more radioresistant than the same histologic type in the cervix uteri; (3) the extent of invasion of the tumor—in prognosticating the results in treating a squamous cell epithelioma of the skin a superficial lesion may be expected to respond much more readily than one which has invaded the deeper structures such as muscle, cartilage, and bone; (4) presence or absence of infection in the tumor-bearing area—infection increases radioresistance; (5) condition of the tumor bed which largely determines its radiosensitivity—the better the nutritional and vascular supply of the tumor, the more radiosensitive it will be—anoxemia diminishes the radiosensitivity of the tumor; (6) whether or not the tumor has received previous treatment—a tumor that has been treated before will be more radioresistant as will the average metastatic tumor.

Following is Paterson's[3] proposed classification of tumors based on the concept of radiosensitivity.

Group 1. Neoplasms disappearing completely with doses below skin tolerance, such as seminoma of the testes, chorionepithelioma, thyroid carcinoma, salivary gland tumors, thymoma, benign giant cell bone tumors, Ewing's tumors, transitional cell sarcoma, untreated rodent ulcers, basal cell carcinoma, lymphoma, and some epithelioma

Group 2. Neoplasms with radiosensitivity corresponding to that of the skin but greater than that of muscle and connective tissue, such as squamous cell carcinomas

Group 3. Neoplasms whose destruction can be brought about with doses above skin tolerance, such as adenocarcinomas

Group 4. Neoplasms with radioresistance greater than that of normal tissue, such as neurofibrosarcoma, osteogenic sarcoma, fibrosarcoma, teratoma, parotid tumors, melanoma of the skin, hypernephroma, and chondrosarcoma.

HISTOLOGIC CLASSIFICATION OF TISSUE RADIOSENSITIVITY (Desjardins)[4]

Data on radiosensitivity of various tissues are given in order of diminishing sensitivity.

1. Lymphoid cells
2. Polymorphonuclear and eosinophilic leucocytes
3. Epithelial cells:
   a) Basal epithelium of the secretory glands, especially the salivary glands
   b) Basal epithelium of the gonads (spermatogonia, follicular epithelium)
   c) Basal epithelium of skin and mucous membranes, particularly of the stomach and intestines
   d) Epithelium of the lung alveoli and liver bile ducts
   e) Tubular epithelium of the kidneys
4. Endothelial cells of the blood vessels, pleura and peritoneum
5. Connective tissue cells
6. Muscle cells
7. Bone cells
8. Nerve cells

DIAGNOSIS BY IRRADIATION

Radiation is valuable as a diagnostic aid in conditions associated with inaccessible new growths. New growths of the mediastinum frequently present a confusing diagnostic problem and the response to radiation therapy may suggest the type of pathology. For example, if a tumorous mass of the mid-mediastinum shrinks appreciably within 72 hours following x-ray therapy, the lesion would be classed in the lymphoma group, probably as lymphosarcoma.

In cases of skeletal pain where radiographic evidence of metastasis is lacking, relief of pain by radiation would suggest the presence of a metastatic process.

A bone lesion in a young child where the diagnosis between osteomyelitis and Ewing's endothelioma is often confusing, may be subjected to a test dose of x-ray therapy. Rapid regression of the lesion and relief of symptoms establishes the diagnosis of Ewing's tumor.

COMBINED THERAPY

Carcinoma of the cervix uteri offers a good example of the conditions which in some cases, can be treated by combined therapy. These lesions may be treated by radical surgery alone, by surgery and irradiation, or by irradiation alone, but the choice of modality depends to a great extent upon the clinical classification established by the League of Nations in 1938. And the welfare of the patient hinges upon close cooperation between the surgeon, the pathologist, and the radiation therapist.

It is generally agreed that radical surgery is indicated only in Group 1 cases, in which malignancy is definitely limited to the cervix and where there is no evidence of extension. However, it may be advisable to precede surgery by radium application. In malignancy of the uterine cervix other than Group 1, where the condition has extended beyond the confines of the cervix, radiation alone is the method of choice. Here a combination of radium and high voltage therapy may be applicable.

RADIATION HAZARDS

Even though radiation therapy both by x-ray and radium emanations is one of the most effective methods known today for combating malignancy, it is also one of the most dangerous, and, when placed in the hands of the ignorant and unskilled, can be dangerous to both therapist and patient. A lack of proper protection and other precautions against direct or scattered radiation by the operator may lead to many serious complications and injuries.

Technical faults are usually those associated with: (1) faulty or improperly installed x-ray apparatus, (2) neglect in the examination of the patient, (3) errors in technic, (4) idiosyncrasies of the patient, (5) associated general debilitating diseases, and (6) ignorance of previous therapy.

SUMMARY

1. The site of action of radiation stimulus upon human and animal tissue is the cell.

2. The power of x-ray and radium rays to penetrate tissue is the basis of radiation therapy.

3. Radiosensitivity of a tumor is the important factor in evaluating radiotherapeutic attack on malignancy.

4. Radiation therapy is valuable as a diagnostic aid in conditions associated with inaccessible new growths.

5. Radiation therapy is one of the most effective means of combating malignancy known today but may be dangerous in the hands of the unskilled individual.

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PERSPECTIVES IN THE PRACTICE OF PUBLIC HEALTH

During the past half century the concepts and the practice of public health have undergone an evolutionary development of increasing momentum and significance. In the wake of the great sanitary awakening and the golden age of bacteriology came the control of communicable disease and the management of the primary threats to infant and maternal survival. Latterly there has come more adequate medical care, a closer linkage of curative and preventive medicine, and the beginnings of serious attacks on the chronic diseases through organized research and community action. There has been increasing recognition of the broader implications of the terms "environmental health" and "occupational health," of the health implications of a maturing United States population, and of the impact on health of a shrinking world. Yet these are but a few of the components which must be dealt with today when we speak of "the public health."

An enlightened perspective is demanded if we are to meet successfully the day's tasks and are to prepare intelligently for coming challenges.—Editorial, *Public Health Reports*, October, 1952.

The Duties and Responsibilities of the Physician to the Cancer Patient

R. McFARLANE TILLEY, D.O.
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This brief presentation will deal with the responsibilities of the family physician of the cancer patient. From many papers that we read and from the addresses we hear, we gain the impression that the cancer problem belongs to the specialist as soon as diagnosis is made.

What will be said here has not been gathered from any text book, standard author, or recognized authority. It is the opinion of one who through 29 years of active professional life has believed that the best and only approach to all the problems of disease should be straightforward, direct, and dynamic; that the primary consideration should be for the individual patient; that even thinking of cancer where we are so often faced with tremendous anxiety and frequent disappointment, the sound approach of prophylaxis, diagnosis, definitive therapy, and general care will yield the best possible result.

At the outset, before indicating what would seem to be the role of the family doctor, a plea must be made for better, more prompt cooperation, and a much closer relationship between the family doctor and the specialist, in the interest of giving better service to the afflicted patient. A much closer relationship is needed than this speaker can report. It has been my misfortune and disappointment to have received negative reports on metastatic carcinoma of bone from the x-ray specialist, usually because the film lacked good definition of the structures involved. The otolaryngologist has scoffed at the small fragment of scar tissue in the tonsillar fossa, only to have biopsy finally prove the presence of malignancy. The urologist and his hospital residents failed to find a carcinoma of the rectum when radical prostatectomy was done, despite an earnest request to search for causes of frank blood in the stools and increasing constipation. The general surgeon did not suspect, nor did the pathologist find papillary carcinoma, grade II, in a ruptured ovarian cyst; the dermatologist superficially fulgurated "a pigmented senile keratosis," which did not heal properly and was soon found to be malignant. So it is my serious, and almost primary, contention that if the family doctor is to meet his responsibility to the cancer patient, he must have better and more willing cooperation from the specialist.

In the field of prophylaxis, the general doctor ought to be the mainstay of the effort, which is largely educational and necessitates an attitude of eternal vigilance. The osteopathic physician has an excellent opportunity to make frequent physical checks because the procedures of osteopathic examination and manipulative therapy require close observation of the structure of the body unobscured by heavy clothing. It should be a simple matter to examine the skin, to check for lymph nodes, to carefully examine the breasts, to palpate the abdomen for masses. Regular, annual visits should be planned for careful history and physical examinations and for visual checks of the body orifices: the mouth, nose, and throat and the accessible genitourinary organs.

Prophylaxis should embrace proper care, advice, and therapy for any chronic source of irritation or inflammation, from the poorly fitting denture, the ill-advised crank diet which keeps the gastroinestinal tract continuously irritated and inflamed, to the laxative habit, and the classical lacerations of the cervix and chronic erosion due to endocervicitis.

Prophylactic education and thought must also be given to materials that apparently have carcinogenic properties as evidenced by experiments on the lower animals. These include certain coal tar products, industrial dusts, excessive doses of estrogenic hormones, and other substances under investigation. However, as far as the human is concerned, it would seem most important that consideration be given to those factors which continuously undermine the general health of the individual and which probably have some influence in changing the controlled precancerous lesion into definitely uncontrolled malignant growth. This plan of prophylaxis has been well dealt with by Levitt.[1] The family doctor should constantly be aware of the developments in this field.

The role of the family physician in diagnosis of cancer cannot and should not be underestimated. He must continuously be aware of the possibility of this problem arising any time in his general practice of osteopathic medicine. This awareness should prevail at every contact with his patients; it should promote actual screening surveys by the physician himself going as far as he can in regard to history, physical examination, and laboratory diagnosis. In addition, if the doctor does not do this work himself, he should advise and arrange for his patients to have thorough examinations at one of the many and growing cancer detection centers. This type examination should not apply just to the large urban centers; the family doctor isolated in a rural area should investigate the services available through the state board of health and other agencies for checking tissues, and doing through cytologic studies on the sputum, stomach washings, urinary sediments, fecal material, vaginal and cervical scrapings, smears, et cetera, obtained from suspicious cases in his practice.

Of course the well-known danger signals, occurring suddenly or insidiously in persons with previous good health, should always be thoroughly investigated by the family doctor and quickly referred for further advice, investigation, or therapy to the proper specialist. Among these important signs or symptoms are:

Unexplained fatigue
Unexplained loss of weight
Unrelieved flatulence and indigestion
Unexplained anemia
Seemingly unrelated high blood sedimentation rate
Hemorrhage
Undiagnosed pain of long standing, which requires narcotics or very high doses of analgesics for temporary relief.

This requirement of early diagnosis is often laborious and difficult, but hope and life for the individual afflicted with carcinoma depends in large measure upon just this effort. The improved and

(Continued on page 236.)

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A SILVER ANNIVERSARY

A memorable occasion for osteopathic surgeons, and an anniversary of historical importance to the entire osteopathic profession took place in Columbus, Ohio, from October 26 to October 30, 1952, when the American College of Osteopathic Surgeons held its twenty-fifth Annual Clinical Assembly. The memory of this meeting should not be permitted to pass without a consideration of its meaning. A detailed account of the Assembly will be published in a forthcoming issue of THE FORUM (January, 1953). It should be noted that integral and vital parts of the Assembly were four other participating osteopathic organizations, the American Osteopathic Hospital Association, the American Osteopathic College of Radiology, the American Osteopathic Academy of Orthopedics, and the American Osteopathic Society of Anesthesiologists. On October 30 the Osteopathic College of Ophthalmology and Otorhinolaryngology opened its thirty-seventh Annual Convention in the same location. Actually not a participant in the Assembly, in effect and significance, this Convention carried more than a time and geographical relationship to the Assembly, since it maintained a continuity of specialty meetings.

The roots of the College of Osteopathic Surgeons are deep, going back to the founder of osteopathy, and to the first school, the American School of Osteopathy. Surgery was as integral a part of the training of early doctors of osteopathy as it was of doctors of medicine, limited as was that training in both instances. An objective study of historical sources will establish the validity of that relationship despite the conflict that arose with those doctors of osteopathy who would have hedged and limited their profession in its development. The enthusiasm for a new truth blinded many of them to old truths. In those early days osteopathy as a profession could have ended in a blind alley. But the profession has moved forward with remarkable consistency toward one goal, a complete and separate but distinctive school of medicine, reflecting the progress of medicine in no sectarian sense, and proudly conscious of its own continuing contribution to the healing arts.

The actual beginning of the College of Osteopathic Surgeons goes back to June, 1926, when a group of ten practicing surgeons met during the Annual Convention of the American Osteopathic Association which was then being held in Louisville, Kentucky. This group shortly thereafter was constituted as the American College of Osteopathic Surgeons, with the late George M. Laughlin as the first president. Of the founders four are deceased; the majority of those living were in attendance at the Columbus Assembly. To them came the satisfaction of seeing years of advance crystallized as distinct achievement.

The College of Osteopathic Surgeons, like all specialty colleges, is essentially a teaching organization. And therein, as for all specialty groups, lies its reason for being. No such groups within the osteopathic profession have better kept to that goal than this College. From a small organization it has grown to a relatively large one. Its quarter of a century of existence has been marked by high activity on behalf of the highest ideals of medicine. At present, among other things, it is doing distinguished work in its development of a Register of Training Programs for those specialty fields that are under the jurisdiction of the American Osteopathic Board of Surgery. On behalf of its own specific school of medicine the College has fought jealously and valiantly that its surgeons might prove worthy of the highest ideals of osteopathy in the service of man.

The four organizations which participated in the College Assembly are independent of the College but are closely related to it, manifesting a true interdependence of service. Each has its own history, its own ideals, and its own achievements. Each by its distinctive contribution helps to make possible the osteopathic school of medicine. From time to time comment will be made on the work of various specialty groups, as was done recently for the Society of Anesthesiologists.[1]

An important element in a stable and secure profession is a membership informed of the purpose and place of its various segments. There is not a specialty within osteopathy that would not gain in appreciation and stature in the eyes of the profession by wider knowledge of its motives, its contributions to osteopathic medicine, and its ideals and practices.

The contribution to osteopathic medicine made by the College of Surgeons in its 25 years of organizational life is inestimable. Many early osteopathic hospitals stand today as concrete evidence of the vision, the courage, and the indefatigability of the particular osteopathic surgeons who founded them. There is a tendency to underplay the contribution that these men made by opining that they only made possible their

1. Editorial: Anesthesiology. J. Am. Osteop. A. 52:117-118, Oct. 1952.

own workshops. It is true that by building institutions, they fulfilled their own purposes, making it possible for them to work at the ordinary business of life which is making a living. But more than that, the institutions which they created in turn led these individuals to fulfill their function in life, that of guarding and conserving the health of a part of the population. Through hospitals and institutions, osteopathy itself moved into a service to the community that is the first duty and obligation of medicine. The College of Surgeons as a group of pioneering men, in the first quarter of a century of its existence has made possible in part that contribution.

The College, moreover, in the fulfillment of its high function presents incontrovertible evidence of the maturity of a total profession, interdependent in the strictest sense. Rightly, no one segment of the profession is greater than the whole, and each portion plays its significant and peculiar role. In the entire drama of osteopathy the role of the College of Surgeons has become especially significant.

Osteopathic medicine has become thoroughly "institutionalized," as the sociologists define that term, acceptable to society as an agent to promote public welfare. It has arrived at that enviable position through decades of organized effort by a few doctors in small districts, by these districts banded into divisional societies, and by the democratic merging of these societies into the American Osteopathic Association, the legislative and executive body that alone can speak with dominion and power for the profession. Keeping pace with organizational advance, its purely professional bodies, its specialty societies, and its teaching colleges have given substance to organization, so that the one aids and abets the other.

The American College of Osteopathic Surgeons is a great auxiliary body, within the totality that is osteopathic medicine. Its greatness lies in its growing ability to lose itself in service to the whole of a profession of which it is an honored and distinguished part. Its silver anniversary is a fitting symbol of its work.

Notes and Comments

A report on the status of man-made diseases formed an interesting study in two recent issues of the *New England Journal of Medicine,* September 25 and October 2. It was based on the effects of chemical, bacteriologic, and physical agents of known or possible hazard to the worker. Anthrax shows recent increase with infective carpet wool as the source. The mortality remains high because of failure to make a prompt diagnosis. Good results have been obtained with the newer antibiotics. Brucellosis has a higher attack rate among urban meat handlers than among farmers. Q fever is found in southern California among workers in dairies, meat-packing plants, and livestock yards. A fatal case of coccidioidomycosis was reported in Massachusetts workers sorting wool from California. Sporotrichosis can occur in agricultural workers, berry pickers, grain-mill workers, and florists. Tularemia is showing a high incidence in laboratory workers. An increased study is being made of all suspected occupational carcinogens, as etiologic agents in occupational cancer, especially chemicals which may bear an etiologic relationship to cancer of the skin, nasal sinuses, lung, bone, and blood-forming organs. The lack of relationship between the toxicity and carcinogenicity lowers the "index of suspicion" with a neglect of necessary vigilance. A study of lung cancer supports the contention that there is a true increase of this disease. Sex differences are said to disappear when environmental factors are ironed out. Cigarette smoking in addition to occupational insult may prove to be a significant cause of malignant lesions of the lung. Knowledge of disease produced by radiant energy has become a requirement of modern medicine. The production and expansion of atomic energy will result in more and more persons exposed to its potentially harmful effects if they are not safeguarded by intelligent protection. The relatively high incidence of leukemia among radiologists is an established fact. There are many disease-producing pneumoconioses. Estimates range from 500,000 to 1 million pneumoconiotic workers from the 50 to 60 million workers in industry. Mining, stone cutting, pottery, and foundry work are the chief sources. Disease-producing pneumoconiosis must be differentiated from the benign type in which the chief hazard is mistaken diagnosis with poor medical advice to the worker. Routine sputum smears from workers exposed to recognized respiratory-tract carcinogens are urged by experts in the field. Toxic chemicals are playing an increasingly important role in occupational disease, with the new pesticides frequently at fault. Atmospheric pollution has become an increased problem with the Donora smog the classic example of its power. The two articles form a definitive analysis of recent pertinent literature and should have the careful consideration of all internists in large industrial centers.

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Americans travelling abroad soon find that they must exercise unusual care in the selection of foods and of the places where they eat. That which is a matter of course in their own country becomes an exception in many foreign countries. There are many influences which have made it possible for the travelers throughout the United States to stop to eat almost anywhere without endangering their health. The Food and Drugs Act, (first passed in 1906, completely revised in 1938 with subsequent amendments as needs have arisen), as administered by the Food and Drug Administration has been the predominant factor in bringing about our enviable status. With the many new and potent drugs that began to be produced 15 years ago and that are now being constantly reported,

such supervision as FDA affords becomes a guarantee of safety and efficacy to the physician and his patient. This agency is constantly alert to infractions of the Durham-Humphrey amendment relating to new drugs. Physicians should acquaint themselves of the wide field over which the Food and Drug Administration operates and constantly cooperate with it.

★ ★ ★

A method has been perfected by which the age of ancient organic objects can be determined with a radioactive carbon technic. A super-bison recently dug up from Alaska's frozen tundra was determined by a Columbia University expert to have been frozen solid for 28,000 years. The meat was found highly acceptable by the dogs of the expedition. By the same carbon 14 method it has been concluded that man has lived on the North American continent for at least 10,000 years.

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Hospital administrators will be interested in a 40-page pamphlet issued by the Public Health Service containing suggested minimum standard plans, equipment, supply lists, and organizations for hospital pharmacy departments. Write for a free copy to Division of Hospital Facilities, Public Health Service, Federal Security Agency, Washington 25, D. C.

★ ★ ★

Commercial feeding of raw garbage to swine has resulted in an outbreak of vesicular exanthema affecting thousands of hogs in twenty-four states in the past several months. Trichinosis and other swine diseases have a similar origin. State health authorities have warned of the dangers inherent in the situation. Garbage must be cooked before it is transported interstate, but the Public Health Service recognizes that state laws prohibiting the feeding of raw garbage to swine may be necessary. Patients should be warned to cook all pork products thoroughly before serving.

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Writing in *Surgery, Gynecology and Obstetrics,* March, 1952, Carl T. Javert, M.D., and Clara Reiss present acceptable evidence that red blood cells from an Rh-positive baby can enter the mother's blood stream and sensitize Rh-negative women during pregnancy. The mechanism appears to be that of an escape of fetal cells through the placental barrier with resulting multiple minute transfusions of the mother with the infant's blood. These conclusions were based on a study of 1,901 human placentas. Escape route appears to be through points of breakage at the trophoblastic endothelial junction where only two cell layers separate one blood stream from the other. This new work suggests that preservation of the junction may depend in part upon adequate diet during pregnancy.

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A training manual of procedures for use by nursing aides and as a guide for instructors in large and small communities is in preparation. When completed it will be made available to hospitals throughout the United States. The American Hospital Association will publish the manual. The inevitable increase in the number of trained nonprofessional nursing personnel should make an authoritative book of great value.

★ ★ ★

Studies made of human semen and prostatic fluid show that they possess marked antibacterial activity against common genitourinary tract pathogens. This activity is of apparent significance in checking infections of the male genitourinary tract and in combating spermatocidal organisms in the vagina.

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The general assumption that cesarean section deprives the infant of some of the blood which it would receive if delivered vaginally has been proved recently by Siddall and coworkers in a controlled study involving 100 cesarean section babies. Findings were based on a comparison of umbilical cords milked or stripped after abdominal delivery and cords of the control group, which were only clamped and severed.

★ ★ ★

Medical literature shows an increasing number of articles on cardiac arrest during anesthesia and surgery in which the complication can be attributed directly to the anesthesia or to the surgical procedure or both. Resuscitation is accomplished essentially by the Beck technic as recently presented in THE JOURNAL (July, 1952). Most recent article seen appeared in the October, 1952, issue of the *Cleveland Clinic Quarterly,* entitled "Cardiac Arrest," it was written by Donald B. Effler, M.D., and Earl C. Sifers, M.D. Authors emphasize the known fact that cardiac arrest appears to occur more often in the good risk patient than in the so-called bad risk. They urge surgeons and anesthesiologists to anticipate the tragedy in "the manner of the old fashioned fire drill."

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Osteopathic physicians interested especially in anatomic literature dealing with body structure should read "Background for an Understanding of Spine and Trunk Function," by Daniel P. Quiring, Ph.D., which appeared in the July, 1952, *Archives of Physical Medicine.* Reprints are available. In his conclusion Dr. Quiring suggests "that man might well imitate the fish in the maintenance of the spine; for the fish, whose locomotor system is the spine and its associated muscles, keeps these parts constantly active. For the trunk, man might well look to the ape which maintains a tilted pelvis, a reduced lumbar curve, and a well balanced thorax and adducted scapulae."

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Quarantine and vaccination regulations operative in the United States beginning October 1 are set forth in a report of the World Health Organization (WHO Technical Report, Series No. 41). Copies of the new regulations may be obtained from the International Document Center, Columbia University Press, New York City, for 65 cents.

Department of Professional Affairs

JOHN W. MULFORD, D.O.
Chairman
Cincinnati

COMMITTEE ON SPECIAL MEMBERSHIP EFFORT

STEPHEN B. GIBBS, D.O.
Chairman
Coral Gables, Florida

MEMBERSHIP—RESPONSIBILITIES AND REWARDS

We have reached a new high in membership this year, which is indeed gratifying. Yet we must be even more deeply concerned now than in the past about the still large number of osteopathic physicians who do not apply for membership. We should not have to campaign to try and sell the profession on the importance and advantage of belonging to the American Osteopathic Association. Rather, every ethical member of the profession should be trying his best to obtain membership in the organization. The service rendered by the Association to its members and to the public is today a real asset and privilege and should be guarded jealously by its members.

We, who are members, should admit only new members who are thoroughly screened and properly motivated to cooperate in organizational activities, to improve the service to members, and to improve medical service and hospital care to the citizens of this country. Always foremost in the minds of osteopathic physicians should be the realization that the duty of doctors of osteopathy is the protection of the health of the public and that the medical care to the public must be guarded and improved from day to day, month to month, and year to year. Performing that duty is a sacred obligation of doctors of osteopathy.

On the other hand, the American Osteopathic Association has a deep obligation to each individual of the organization to render service, advice, and help impartially without favoritism, bias, or prejudice. It is a service organization, a servant of its members, dedicated to accomplish for them everything possible that is ethically, morally, and intellectually honest, honorable, and just. I believe the American Osteopathic Association is doing this. If it should happen to do otherwise, or if I thought it was doing otherwise, I would be the first to challenge its governing body and ask why it was not following the concepts and precepts that have been laid down in the Constitution and Bylaws for the protection of members and for the protection of the public. I am sure I would get an audience and would be heard the same as any other qualified member would be if he asked a similar question or wished to be heard.

The American Osteopathic Association is indeed a democratic organization. It is not operated for any one man or group of men; it is operated for every member. Let no man think that he can control it. He cannot. If anyone, by any stretch of the imagination, thinks he could, let him try. He will be shown democracy at work.

Be proud you are a member of the American Osteopathic Association and never miss an opportunity to impress upon your fellow members, nonmembers, your patients, and the public generally, the service rendered by this organization to its members and to the public and the important position it plays in the everyday life of members and of the public.

Contribute to the American Osteopathic Association by becoming vitally interested in its organization, policies, and the people you elect to guide its destiny. The osteopathic physician who does not take an active part and interest in his national association should not be considered worthy of membership. Our organization renders service to its members, so let us who belong reciprocate by rendering service to the organization.

VINCENT P. CARROLL, D.O.

MEMBERSHIP REPORT AS OF NOVEMBER 1, 1952

Membership Count, October 1, 1952		8,333
Applications received in October, 1952	15	
Graduates licensed in October, 1952	121	136
Deaths in October, 1952	6	
Resignations, October, 1952	5	11
Gain in October, 1952		125
Membership Count, November 1, 1952		8,458

HONOR ROLL

Alden Q. Abbott
L. B. Foster
Harold E. George
Kirk L. Hilliard
E. R. Komarek
Elmer J. Lee
D. C. MacNeil
Orel F. Martin
Henry Palmaffy
Ray H. Thompson
Wilma Westfall
John Wood
Francis J. Yukl

Department of Public Affairs

DONALD M. DONISTHORPE, D.O.
Chairman
Los Angeles

BUREAU OF PUBLIC EDUCATION ON HEALTH

HOBERT C. MOORE, D.O.
Chairman
Bay City, Mich.

SEMIANNUAL MEETING OF BUREAU OF PUBLIC EDUCATION ON HEALTH

The Bureau of Public Education on Health will hold its semiannual meeting at the Central Office on December 11, 1952. Those in attendance, in addition to the chairman, will be Carl E. Morrison (1953), vice chairman; John P. Wood (1954); Eugene D. Mosier (1954); Phil R. Russell (1955); and Robert E. Cole (1955). Each meeting of the Bureau has proved a fruitful source of discussion and review of problems relating to the objective of the profession of making a maximum contribution to the nation's health. In no one state in the union can it be said that the profession is being permitted to utilize to the greatest possible efficiency its knowledge and skill. In all areas, therefore, the maintenance of a public education on health program is essential if the ultimate objective of complete integration into the state and national health programs is to be achieved. Laws in a state which permit an unlimited practice of osteopathic medicine and surgery are not enough. They form only the foundation upon which the public health program can be built. Membership on state boards of health, participation in voluntary health service plans, eligibility to provide care under state welfare programs,

and recognition of the qualifications of osteopathic physicians and surgeons under all public health laws are only a few of the matters of concern in the various states. Restriction or limitation in any of these areas of the over-all health program of the nation redounds to the detriment of the sick and injured. The public health is not promoted where healing art knowledge and skill is hampered or ignored.

The basic request of the osteopathic profession insofar as state public health laws are concerned has been that the laws licensing doctors of osteopathy permit the use of all diagnostic and therapeutic procedures and modalities, including drugs, manipulation, and operative surgery. All doctors of osteopathy have been trained in their use. Nonetheless, in a small number of states the regulatory laws, while permitting doctors of osteopathy to care for all diseases and human ailments, do not permit them to utilize all the diagnostic and therapeutic agencies required by the health needs of sick and injured patients. One would suppose that such limitations result from an oversupply of general practitioners. "Health Resources in the United States," a recent survey published by The Brookings Institution, indicates, however, that only 36 per cent or 72,550 of the 201,277 doctors of medicine in the United States are engaged exclusively in a general practice. The national average for general practitioners was 49 per 100,000 population. The two areas of the country where the laws of the states are least favorable to the osteopathic profession, we find, have the smallest average number of general practitioners per 100,000 population, namely, the South Atlantic states with 40 and the East South Central states with 38. Obviously, then, the laws of those states in these areas which restrict or hamper a doctor of osteopathy in caring for his patients have not been enacted because there is an oversupply of general practitioners. To the contrary, these areas are most direly in need of competent physicians. The same areas with a shortage of general practitioners, the survey shows, have the smallest percentage of approved internships filled and students in medical schools.

There is ample evidence available, therefore, to substantiate the contention that states which restrict or hamper the osteopathic profession in the pursuit of its objective of promoting the public health are the same states which for other reasons are suffering from an insufficient supply of general practitioners of the allopathic school of medicine. It would appear, therefore, that part of the program of the osteopathic profession in these areas must include the education of legislators, public health officials, and lay persons on the general health problems pertaining to the states and the related factors which tend not only to deter members of the osteopathic profession from settling in those areas, but also the practitioners of other schools of medicine. In states where all practitioners of all schools of the healing arts have been justly and fairly dealt with, conditions appear to result which are conducive to general improvement in the status of health affairs in the state.

Department of Public Relations

CHESTER D. SWOPE, D.O.
Chairman
Washington, D. C.

FILMSTRIP ON LABORATORY TESTS FOR SYPHILIS

A filmstrip illustrating the method of performing the three venereal disease research laboratory tests for syphilis was released recently for distribution to State Health Departments and Regional Offices of the Public Health Service by Dr. Theodore J. Bauer, Chief of the Division of Venereal Disease, Public Health Service.

The filmstrip, intended as an aid in teaching laboratory technicians, medical students, or physicians to perform the slide flocculation, the tube flocculation, and the spinal fluid VDRL tests, provides technical instructions which will help to standardize performance of these tests for syphilis.

It was produced for the Division of Venereal Disease by the Audio-Visual Branch of the Communicable Disease Center at Atlanta, Ga. Dr. Sidney Olansky, Director, and Mr. Ad Harris, Chief Serologist of the Venereal Disease Research Laboratory at Chamblee, Ga., were technical advisers in the production of the filmstrip.

"VDRL Tests for Syphilis" is a 35 mm., 100 frames, black and white filmstrip with 33⅓ r.p.m. sound disk. A utilization guide, with reference material relating to the tests, is supplied with the filmstrip.

The filmstrip will be available on loan from the Division of Venereal Disease, State Health Departments, and Public Health Service Regional Offices to schools, health departments, and laboratories desiring to use it.

Institutions and organizations may obtain authorization to purchase the filmstrip from the Division of Venereal Disease, Attention: Technical Aids and Services Branch, Public Health Service, Federal Security Agency, Washington 25, D. C. The cost of the filmstrip is $5.00.

NATIONAL INSTITUTES OF HEALTH

Dr. C. J. Van Slyke, former Director of the National Heart Institute, has been appointed as an Associate Director of the National Institutes of Health, succeeding Dr. David E. Price who moves up to the newly created post of Assistant Surgeon General of the Public Health Service.

The new assignment moves Doctor Van Slyke to the central offices of the Institutes from the National Heart Institute where he has served as Director since its establishment by Congress in 1948. He will be succeeded at the Heart Institute by Dr. James Watt, who for the past several years has been in charge of the field laboratory of the National Microbiological Institute, located at Louisiana State University Medical School.

In his new post, Doctor Van Slyke will assist Dr. William H. Sebrell, Jr., Director of the National Institutes of Health. His principal responsibilities will be the coordination of the Institutes' programs of research and training grants, disease control and community services, professional training and relationships with national foundations, health and welfare organizations. Widely known among investigators in the medical sciences, he was instrumental in the establishment and development of the research grants program of the Public Health Service.

SPECIALTY BOARD EXAMINATIONS

American Osteopathic Board of Pathology.—Written examinations in pathology and/or clinical pathology will be given May 7, 1953, at or near the residence of the applicant under the proctorship of a selected member of the osteopathic profession. The practical and oral examination in pathology and/or clinical pathology will be given July 10, 1953, at the Chicago College of Osteopathy beginning at 9:00 a.m. Address the secretary, Norman W. Arends, D.O., 13119 Sherwood Drive, Huntington Woods, Mich.

Current Medical Literature

DISCOGRAPHY

TECHNIQUE, INDICATIONS, AND EVALUATION OF THE NORMAL AND ABNORMAL INTERVERTEBRAL DISC

Roentgenographic demonstration of the nucleus pulposus has been accomplished by injecting the nucleus with an opaque substance by direct puncture of the disk through the spinal canal. Results of this method are reported by Ralph B. Cloward, M.D., and Louis L. Buzaid, M.D., in the October, 1952, *American Journal of Roentgenology, Radium Therapy and Nuclear Medicine.*

Cases in which ruptured disk is suspected from a history of back injury and subsequent low-back pain are best diagnosed by this procedure. On the other hand, those showing nerve root compression signs and suffering pain along the sciatic nerve should be studied myelographically, as should cases of intraspinal protrusion of the disk.

As discography is some times painful, 0.2 gram of Nembutal and 0.13 gram of morphine sulfate should be given 1 hour before beginning the procedure. With the patient on the table with his knees drawn up under his chin a true lateral roentgenogram of the lumbosacral spine is made. The skin in the area is antiseptically prepared and the patient is draped. A 1 per cent solution of Novocain is injected to anesthetize the skin over the spaces between the third and fourth lumbar vertebrae, the fourth and fifth lumbar, and the fifth lumbar and first sacral vertebrae. Then a 1½ inch-No. 19 needle is inserted full length at the midline between the fourth and fifth lumbar vertebrae and a second needle between fifth lumbar vertebra and the first sacral. The position of the needles should be checked by roentgenogram to make sure their direction is in the same plane as the center of the intervertebral space.

Next, either a No. 22 or 24 4-inch spinal needle is inserted into the larger needle and pushed through the ligamentum flavum, the posterior dura, and into the spinal canal. At this point a spinal fluid specimen should be obtained. Continuing, the needle is pushed through the anterior dura and then into the disk. On entering the disk the annulus fibrosus offers resistance but this is reduced when the needle enters the nucleus pulposus. Again, the position of the needle is checked roentgenographically; the tip should be in the center of the nucleus, that is in the midvertical plane and at the junction of the posterior and middle third of the interspace.

The authors suggest using a 35 per cent solution of Diodrast as the injection material. If desired 0.5 to 1.0 cc. of 1 per cent Novocain solution may be administered 3 minutes before the Diodrast to prevent severe pain. With a 10 cc. Luer-Lok syringe, 0.5 to 1.0 cc. Diodrast may be introduced into a normal disk while in a defective disk from 2 to 5 cc. can be injected easily. The syringe should be left in place and gentle pressure maintained on the plunger for about 1 minute to allow diffusion of Diodrast through the nucleus. Lateral roentgenograms are made and interpreted after the two disks have been injected and the syringe has been removed. If both disks are normal, the procedure is repeated for the disk between the third and fourth lumbar vertebrae. When the roentgenograms are completed, the needles are removed, the patient placed on his back with his knees flexed on the abdomen and spread, and anteroposterior stereoscopic roentgenograms are taken with the roentgen tube tilted in the plane with the lumboscarcal articulation. Before the patient is released, lateral films in a standing, weight-bearing position are made. The entire procedure should take only about 30 minutes. Diodrast remains in the nucleus pulposus a very short time—sometimes not more than 20 minutes; it usually remains longer in the ruptured disk than in the normal disk.

This technic permits a more accurate picture of the interior pathologic anatomy of the injured disk than do usual myelography, roentgenography, or exploratory surgery. It has also increased understanding of the physiology of the intervertebral disk.

Book Notices

A TEXTBOOK OF PHARMACOLOGY. By William T. Salter, M.D., Professor of Pharmacology, Yale University School of Medicine. Cloth. Pp. 1240, with illustrations. Price $15.00 W. B. Saunders Company, West Washington Square, Philadelphia 5, 1952.

In his preface the author comments on the diverse subjects lumped together under the heading of pharmacology and points to the need of an undercurrent philosophy to weld understanding and weed out nonessentials. Therefore, he has chosen pathologic physiology as his approach to writing on the subject. He has attempted to present material which he believes necessary for the modern practitioner to know and understand.

Part I provides an interesting history of pharmacology and basic procedures and practices involved in the use of drugs. Part III outlines preferred drugs, and several alternates, for therapy of many clinical disturbances. It includes as well chapters on the development and use of chemotherapeutic and chemoprophylactic agents. Part IV, "Toxicology," gives complete coverage of toxic reactions to basic compounds, et cetera; symptoms, course of untoward reactions, and treatment.

Part II, "Drug Action on Physiological Mechanisms," comprises one half the entire volume. Beginning with pain and pain relievers, this section deals with basic physiology of the human body and discusses the physiologic action of drugs used in the therapy of most disturbances. Explanations are easily understood and include the terms describing symptoms commonly used by patients. This part, as are the others, is well illustrated and well documented. Little attempt is made to inform the student of proprietary preparations—to do that well would require a dictionary rather than a teaching text.

This is a modern text in every sense of the word. It gives attention to historical and developmental data. It includes up-to-date material. And, it is written in a congenial but careful manner that reveals the author's enthusiasm and kindles the student's interest.

WHEN DOCTORS ARE PATIENTS. Edited by Max Pinner, M.D., and Benjamin F. Miller, M.D. Cloth. Pp. 364. Price $3.95. W. W. Norton & Co., Inc., 101 Fifth Ave., New York City, 1952.

Everyone is interested in the physician's reaction as a patient. Doctors themselves would know how their tribe behaves when put to the test of serious illness, and patients, so often recipients of sage and stoic advice from their physicians, will be curious as to how these physicians stand the ordeal. Some thirty-two physicians who had or now have serious chronic illnesses make up the authorship of this book. Seven write under pseudoynms; the remainder employ their real names. All write well, a few with great skill and beauty. A number of them, seriously ill, still carry on the practice of medicine. Among the diseases represented are multiple sclerosis, epilepsy, migraine, rheumatoid arthritis, cancer, narcotic addiction, hypertension, coronary occlusion, and manic-depressive psychosis.

Special note should be made of the article by Henry E. Sigerist, M.D., world-famed medical historian now living in retirement in Switzerland where he is working on an eight volume history of medicine, the first volume of which was recently reviewed and made a subject of editorial comment in this publication. Dr. Sigerist's problem is cardiovascular.

The volume is a valuable study on the inner life under the assault of illness.

THIS IS YOUR WORLD. A book for the orientation of professional workers to the emotional problems of the chronically ill patient; tuberculosis and the individual. Written and illustrated by Harry A. Wilmer, M.D., Ph.D. in Path., Consultant in Psychiatry, San Mateo County Tuberculosis Sanatorium; Instructor in Medicine (Neuropsychiatry), Stanford University, San Francisco; Consultant to Division of Chronic Disease and Tuberculosis, United States Public Health Service, Washington, D. C. Foreword by Adelaide McF. Johnson, M.D., Ph.D., Consultant in Psychiatry, University of Minnesota, Member, Chicago Psychoanalytic Institute. Cloth. Pp. 165, with illustrations. Price $5.00. Charles C Thomas, Publisher, 301-327 East Lawrence Ave., Springfield, 1952.

Many years ago a great American physician (Richard Cabot: "What Men Live By") pointed out that the actual treatment of such a disease as tuberculosis was in itself not sufficient, even if of the most approved type. The life of the patient as an individual must have consideration. In that day group psychotherapy was unknown even as a phrase, but its development and application make possible the treatment of the emotional problems of the chronically ill patient by the professional worker who has acquired a skill inconceivable in Dr. Cabot's day. The book's chief value to the practicing physician will be to develop in him an awareness of the disparity between the doctor as "a skilled technician grinding out diagnoses supported by specific tests and calling for specific antibiotics" and the physician employing the art of medicine to treat the whole patient.

AN INTRODUCTION TO MEDICAL SCIENCE. An Elementary Text on Pathology. By William Boyd, M.D., Dipl. Psych., M.R.C.P. (Edin.), F.R.C.P. (London), F.R.C.S. (Canada), LL.D. (Sask.), M.D. (Oslo), F.R.S. (Canada), Professor of Pathology, University of British Columbia, Vancouver, B.C., Canada. Cloth. Ed. 4, thoroughly revised. Pp. 304, with illustrations. Price $4.50. Lea & Febiger, Washington Square, Philadelphia, 1952.

The author's "Pathology of Internal Diseases" and his "Surgical Pathology" are known to numberless medical students and form an indispensable portion of the reference library of every physician. To this text in pathology designed for the laboratory technician, the nurse, or the physiotherapist, the author has brought the same excellence that characterizes his more definitive works. As a general introduction to the study of disease the volume would be of great assistance to the lay writer who needs an airplane view of the subject of disease. The author's flowing and lucid style makes for ease and interest in reading.

THE INTERNSHIP. By Horace L. Pullen, A.B., M.D., F.A.C.P., Professor of Graduate Medicine, Director of the Division of Graduate Medicine, Vice-Dean, Tulane University of Louisiana, School of Medicine, Senior Visiting Physician, Charity Hospital of Louisiana at New Orleans, Consultant in Medicine, Veterans Administration Hospital, New Orleans, Consultant to the Surgeon General, Department of the Army, Washington, D. C. Paper. Pp. 35. Price $1.25. Charles C Thomas, Publisher, 301-327 E. Lawrence Ave., Springfield, Ill., 1952.

This is the 154th in the American lecture series of monographs in which the subjects are not presented comprehensively but are written to inform the medical student and the general practitioner of the more salient features of each subject. This monograph grew out of the action of the Council on Medical Education in Hospitals of the American Medical Association advising that an attempt should be made at reclarifying and redefining the internship.

Limits of the volume make it impossible to deal with the personal problems of the intern, hence this study confines itself to a consideration of the internship as an educational activity. Under the heading, "Suggested Modification of the Internship," the author suggests placing the fourth year medical student on a 12-month basis as a junior intern and making the fifth year, the senior internship, a continuation program. Such a plan will place more responsibility on the medical school for graduate medical education and make more direct their control of the teaching hospital. Outlying community hospitals would be directly influenced by the schools.

This little monograph and its references to the literature is worthy of study by the Bureau of Hospitals of the American Osteopathic Association.

THE QUIET ART. A Doctor's Anthology. Compiled by Dr. Robert Coope. Cloth. Pp. 284. Price $3.00. E. & S. Livingstone, Ltd., Edinburgh and London; Distributed by Williams and Wilkins Company, Mt. Royal and Guilford Aves., Baltimore, 1952.

It would be more than an even bet that an anthology for doctors under such a title would have been compiled by an English physician, as is this volume. Its title is lifted out of Virgil, reflecting the finest traditions of medicine of all time—"it was his part to learn the powers of medicines and the product of healing, and careless of fame to exercise *that quiet art.*" Even in this day of doctor-transportation by automobile and self-piloted plane, medicine, if it is practiced as the art that it is, still remains "a quiet art." And the very reading of the text brings to one a sense of the completeness which the practice of medicine brings to life.

To this reviewer the selections for the most part are excellent—in any anthology there are always the omissions one cannot forgive, the inclusions one cannot understand. It is heavily English, and rightly so, but Osler is here, and Oliver Wendell Holmes, and Cushing of more recent days, to name doctor-writers. And there are enough unknown contributors to give the zest of discovery to the reader. The American distributor—the volume is printed in England—is to be commended for making the text available here. It makes an excellent gift book.

DIATHERMY. By Stafford L. Osborne, B.P.E., M.S., Ph.D., Professor and Chairman, Department of Physical Medicine, Northwestern University Medical School. Paper. Pp. 113, with illustrations. Price $3.00. Charles C Thomas, Publisher, 301 E. Lawrence Ave., Springfield, Ill., 1950.

There is too widespread therapeutic use of high frequency currents by doctors whose information about their equipment and its value is confined to the pamphlet of the manufacturer and instruction by the dealer. This monograph attempts to correct for its reader that paucity of knowledge. As is true of any therapeutic agent, the optimum benefits of diathermy are dependent upon informed, judicious usage. Considerable harm has resulted from its ignorant application. Section V of this monograph, entitled "Contraindications for All Types of Diathermy Application" is an unequivocal statement guarding against misuse. Section VI on "The Diathermy Prescription" is equally readable.

BASIC PRINCIPLES OF CLINICAL ELECTROCARDIOGRAPHY. By Hans H. Hecht, M.D., Associate Professor of Medicine, University of Utah School of Medicine, Salt Lake City, Utah. Paper. Pp. 88, with illustrations. Price $2.00. Charles C Thomas, Publisher, 301 E. Lawrence Avenue, Springfield, 1950.

Attempts to standardize medical terminology and to make clinical procedures uniform are constantly in action. Since the practice of medicine is dependent upon individual judgment and interpretation, terms, procedures, and results are often invalid when taken out of context. This author, however, approaches the problem of universal understanding in electrocardiography from a basic point—exactness and uniformity of fundamental concepts. He has, then, sifted the literature as well as current usage in order to present careful explanations of electrocardiographic theories and technics.

Descriptions of the various lead technics are given along with illustrations of accepted normal and abnormal tracings. Little or no attention is given to interpretation of the tracings except as clarification of the discussion at hand. A brief but complete glossary adds to the exactness of this author's work.

It must be stressed that this monograph is an attempt to clarify concepts, procedures, and terminology; for those who desire broad interpretive material the author provides copious references to appropriate literature.

DU PONT, The Autobiography of An American Enterprise. E. I. Du Pont de Nemours & Company, Wilmington, Delaware. Cloth. Pp. 138, with illustrations. Charles Scribner's Sons, 597 Fifth Ave., New York 17, 1952.

Herein lie the dreams and ingenuity of a man as they influenced and were influenced by the development of an entire country. The 150-year saga of Du Pont began with conditions and circumstances in France which prompted Eleuthère Irénée Du Pont to emigrate in 1802 to the United States, of which there were then sixteen. The dire necessity for good gunpowder, other than that imported from Europe, may be considered as the second important factor contributing to the birth of the Du Pont mills on the Brandywine river near Wilmington, Delaware.

Excellent black and white reproductions, many colored illustrations, and well-written narratives trace the progress of the Brandywine mills and the corresponding advance of the United States from the very early 1800's. Today there is scarcely a phase of American life left untouched by Du Pont developments. Certainly medicine and medical research have felt the influence of their products.

The story of the development of E. I. Du Pont de Nemours and Company is fascinating reading as presented in this beautiful edition.

THE DUTIES AND RESPONSIBILITIES OF THE PHYSICIAN TO THE CANCER PATIENT—TILLEY

(Continued from page 228.)

better integrated teaching of cancer detection in our colleges, recently supplemented by grants from the United States Public Health Service, will help greatly in training physicians to make early diagnoses.

So far I have attempted to place proper emphasis upon the individual approach to the cancer problem. In considering therapy, the planning of a possibly curative or palliative procedure should never be approached without most careful consideration of the patient for whom treatment is intended. Once again, a plea is made for closer cooperation between the specialist and the referring family doctor. My experience has been that a skillful, radical approach to the early malignant lesion is almost always justified. The family doctor will be wise to follow this approach if, after careful evaluation, it is believed that the patient will be given either a reasonable chance of cure or a shorter life worth living. George Pack[2] of Memorial Hospital, New York, has often asked this important question, "After this radical surgery, is the human residue going to be happy?"

Much of the future for the patient depends upon the attitude and the skill of the family doctor, who should provide the firm, supporting, generous, uplifting influence through the period of agonizing uncertainty that is so often experienced during diagnosis, during therapy, and the period when either recovery will result or physical deterioration become evident.

One of the highest compliments ever paid to an osteopathic physician was by a widow in a small Missouri town, whose husband had lived for several years after it was learned that he suffered from a fatal malignancy. She told how the doctor cared for her husband through this long illness, how he met the many physical problems that occurred, how he kept good humor, optimism, and faith in balance, how he helped the family and the patient to meet the difficult and conflicting suggestions of friends and relatives, and even similar advice from other doctors who were interested in the case. "He was just a good doctor," she said, and her words implied a supreme confidence and satisfaction in the difficult service that had been rendered with skill and scientific ability.

Of course there are not many physicians who will bluntly and directly inform a patient that he is suffering from a fatal disease and that his life is short. Excluding a few so-called specialists, who pride themselves upon being oracles in their department, such methods are not in vogue. The results, however, are frequently the same when the doctor takes the patient's family into his confidence and reveals a very unfavorable prognosis. When this is done, the invalid himself is very likely to get an accurate idea of the doctor's opinion through the attitude of the family. It seems that the best plan in these cases is to let the true nature of the problem unfold itself somewhat slowly, and to choose carefully the member of the family or the close family friend to whom the true diagnosis is given.

Much has been said about the absurdity of mind-cure in such conditions, but "mind-cure" is not entirely a delusion. The attitude of the physician should be encouraging on every possible occasion. In fact, he should not allow himself to take any but an optimistic view of every case, insofar as is possible. This can generally be done if the philosophic approach to the problem is well thought out. It should not be forgotten that human nature is apt to revolt at an unfavorable diagnosis; the patient may feel that if the physician has such a hopeless idea of the case there is no use in continuing treatment under his particular direction.

There are many ways of expressing the duty of the family doctor in relation to the cancer patient, but it cannot be better said than in the Code of Ethics of the American Osteopathic Association. The reading of Chapter 1, "The Duties of Physicians to Their Patients," is most earnestly suggested, with particular attention to Sections 4 and 5.

Finally, the peculiar clinical fact exists, that osteopathic care often relieves suffering, improves the sense of well being, and reduces the dosage of narcotics. This has been validated by many patients suffering from incurable cancer and by many osteopathic physicians who have cared for them during the terminal stage of their disease.

1400 E. Patterson St.

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2. Pack, G.: Lecture note.